THE OIL WEEKLY

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The Oil Man's Calendar

SEPT.	
8–12	American Chemical Society, Atlantic City.
17–19	National Petroleum Association, Atlantic City.
OCT.	
2– 3	West Virginia Oil & Natural Gas Association, Clarksburg.
6– 9	National Safety Congress, Chicago.
9–11	Texas Mid-Continent Oil & Gas Association, Beaumont.
16–17	American Association of Petroleum Geologists, Pacific Section, Los Angeles.
16–18	American Institute of Mining & Metallurgical Engineers, Petroleum Division, Dallas.
20–22	Independent Petroleum Association of America, Tulsa.
30–31	American Institute of Mining & Metallurgical Engineers, Petroleum Division, Los Angeles.
31	California Natural Gasoline Association, Los Angeles.
NOV.	
2– 7	American Petroleum Institute, Annual Meeting, San Francisco.
DEC.	
3	New Mexico Oil & Gas Association, Artesia.
5	Oklahoma Stripper Well Association, Tulsa.

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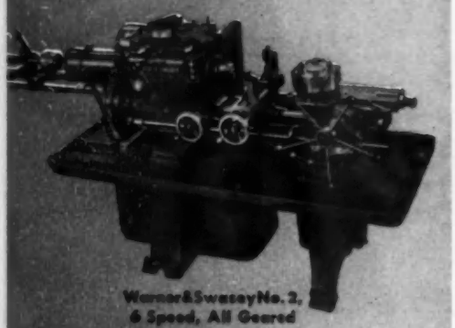

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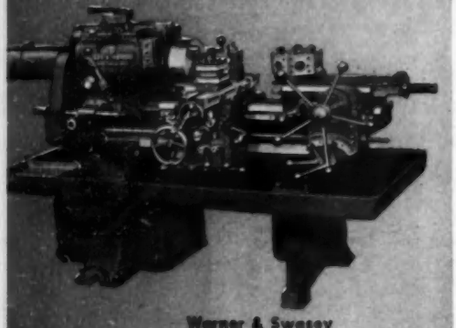

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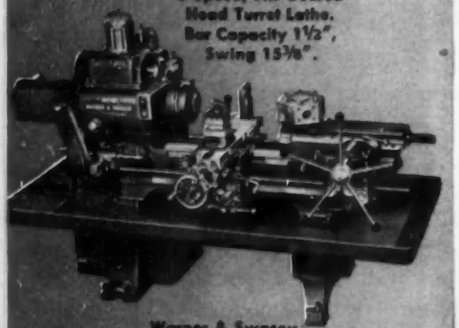

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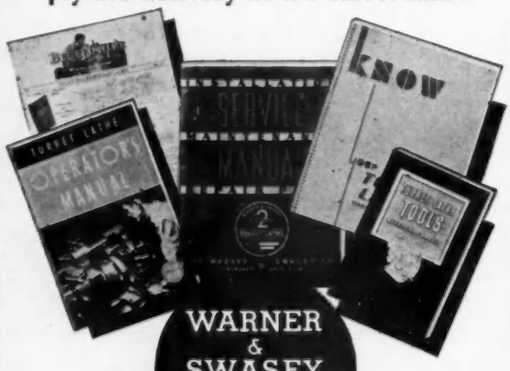

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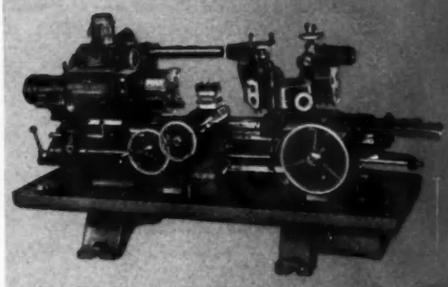
Cleveland



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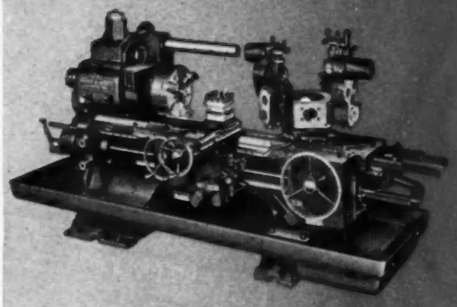

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Bar Capacity 3½"
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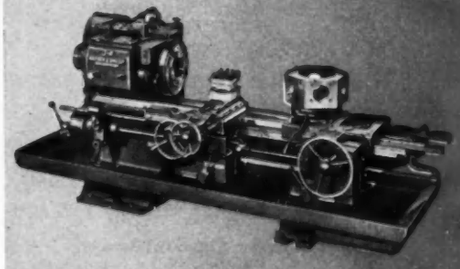

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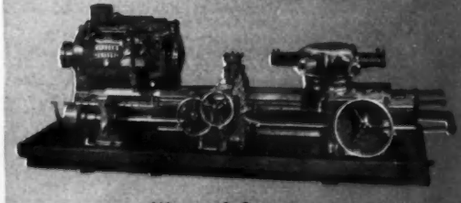

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The Changing Panorama

Gently, Gently, Mr. Ickes

Public May Feel Talk of Arresting Drivers Is Czaristic Attitude

Proposal of Secretary-Co-Ordinator Ickes to arrest drivers in National parks who start their cars in such way as to develop unusual consumption of gasoline, or whose smoking cars indicate motor inefficiency, and his statement that the elimination of these practices would save 20 percent in gasoline consumption, are unfortunate.

They are unfortunate for the secretary, because the American people take it as an evidence of a czaristic attitude, and his figures on savings have been punctured by a report of the Bureau of Standards.

American people respect Secretary Ickes' almost fanatical belief in conservation, but they most strongly object to an obsession being made into a mandate. Probably the Secretary *can* fix rules in national parks to suit his own desires, but we submit to the Secretary that common sense is also a rule which must be applied.

And American people most certainly will continue to say, as they have already said, "if Ickes can get away with a rule like this, a rule which makes a transgressor out of an inoffensive citizen who does not want to waste oil, and who has never been encouraged by his government, either by precept or example, to conserve, then the Secretary is a dangerous man to be given too much power."

Of course Mr. Ickes reputation as a conservation statistician did not improve when the Bureau of Standards said that no such saving as he indicated would be made by elimination of "jack-rabbit starts" and smoking exhausts. The idea that 20 percent could be saved by the suggestion is of course, absurd.

And while on the subject, we should like to point out to Mr. Ickes that if the government's proposal on reduction of motor car output works out, there will be comparatively few cars without smoke from their exhausts within a year or two—mandate or no mandate. And if the secretary will ask the Treasury department to make an investigation of visitors in National parks, he will find that most of them do not have incomes as large as either the private or public income of Mr. Ickes, and that none of them have the United States government ready to take care of a garage repair bill for them.

The matter is of no great importance, save to those who might be arrested, except that it shows an impetuosity which we had begun to hope Secretary Ickes had put behind him.

Public Mistaken

Belief That a Production Shortage Exists Should Be Allayed at Once

The Missouri legislature has adopted a resolution asking the "oil producing states, the Department of the Interior and the Congress of the United States to repeal and withdraw any limitations upon the production of oil during the present unlimited emergency."

This action is another example of the mistaken public belief that there is a threatened shortage of petroleum in the United States, when conditions causing the industry and government much worry were created by the diversion of tankers from normal service and not by any thought of the industry not being able to adequately meet all consumption demands.

The Tulsa Chamber of Commerce is to be congratulated upon its recent action in attempting to correct the public misunderstanding regarding the supply of oil and its products. It has urged Petroleum Coordinator Ickes to take steps to disabuse the public mind of misconceptions regarding the ability of the industry to produce and manufacture sufficient petroleum products, and has placed the facts before all Chambers of Commerce in the United States. It is hoped that this will help allay public fears concerning the plenitude of petroleum from the standpoint of supply and refining capacity, and correct the mistaken public belief that there is any production shortage.

Don't Abandon Stripper Wells

Would Be Economic Loss With Little Equipment Salvage Value

A rumored suggestion that it would be beneficial to abandon about 50,000 of the smallest stripper wells in the United States, so pipe and other items might be salvaged to help relieve the industry's equipment situation, is preposterous.

From the equipment standpoint, the quantity that could be salvaged would be indeed negligible, most of it would be in such poor condition that it could not be used, and it would not be suitable for modern wells which usually are deeper and require sturdier machinery than that installed on the majority of wells that would fall into this classification.

The idea is equally illogical from a reserve standpoint. While these wells produce little oil individually, collectively their output is sizeable. Their abandonment would mean irreplaceable loss of important future reserves and current daily yield.

If at all possible, every stripper well that can be kept on production should be maintained. They have already been drilled, and to replace them with new wells would require additional drilling and producing equipment, as well as enlarged capital investment.

Embryonic G. Men . . .

Protection of oil properties against possible sabotage will give many an oil company executive and employee an opportunity to practice what he has secretly desired to do—be a G. Man!

That the properties should be protected goes without saying, but if we are not mistaken we are going to see a lot of ill will generated for some oil companies by confusing the real issues.

Which reminds us of a story heard long ago:

In a little North Texas town a ten-year-old negro boy had attached himself to the job of pick-

SHAKE-OUTS
From The News

Use of fuel oil, in the present emergency, should be increased and not restricted, says Kalman Steiner, oil heating authority, in the July issue of Heating, Piping and Air Conditioning in an article under the title: "Expand the Use of Fuel Oil." This writer fears that the publicity given to probable shortages of fuel oil on the East Coast, due to the tanker situation, may result in a widespread conversion to other fuels everywhere. This authority points out that increased gasoline production will bring additional supplies of fuel oil with probable lower prices and that fuel oil involves but little manpower in either its production or consumption and so "helps to conserve that greatest of our national resources—man power."

Assuming that 38 percent of current annual fuel oil consumption—325,000,000 barrels—could be converted to coal, Engineer Steiner makes these interesting deductions:

"Converting 325,000,000 barrels of fuel oil to coal, on straight Btu comparison, requires 81,000,000 tons, or about one fourth of our total 1938 coal production. But since oil is utilized at greater efficiency than coal, especially in millions of domestic heating plants, it is more likely that we would have to increase our coal production by 40 percent to replace present oil-burning plants with coal burners. Normally, our railroad traffic is composed to the extent of 37 percent of coal and coke. Complete substitution of coal for oil would therefore increase rail freight by 15 percent and the railroads now face an enormous problem of moving defense materials. The total coal, bituminous and anthracite, moved into New England during 1938 was 17,500,000 tons. The total fuel oil moved into New England during 1939 was 46,481,000 barrels, which in straight Btu is the equivalent of 11,000,000 tons of coal, but in actual utilization the equivalent of probably 20,000,000 tons of coal. To replace all fuel oil, therefore, the railroads would have to more than double their coal traffic to New England. And finally, the existing distributing channels of bulk plants and tank trucks would have to be promptly replaced by coal yards and coal trucks."

⌄

A British communique of the past week told of an R. A. F. bombing expedition that set one of Germany's synthetic gasoline plants at Leuna, near Leipzig, afire. This is one of the Reich's larger ersatz gasoline plants, being described by the British as producing nearly 500,000 tons, or about 3,700,000 barrels, annually. An earlier communique of the week stated a synthetic oil plant between Lens and Bethume, France, also was left in flames.

⌄

The Wall Street Journal predicts that oil industry capital expenditures during 1941 will be above normal, with every division participating in the increase with the possible exception of the production branch.

⌄

Jack Dempsey, former world heavyweight boxing champion, has reentered the oil business. Dempsey and Bobby Manziel, one of his former sparring partners, were associated in the drilling of several wells in the Gladewater area of the East Texas field, and now will drill a wildcat test in Wood County, East Texas, in conjunction with Gulf Oil Corporation.

⌄

Chromium, used for hardening steel, special chemical processes, and high-speed cutting tools, last week became the fifteenth product to be placed on the full priorities list. Africa, the Philippines and Turkey are principal sources of chromium ore, 750,000 to 800,000 long tons being imported into the United States annually.

⌄

Threatened shortage of fuel oil on the Eastern seaboard and a halt on manufacture of oil-burning equipment in Canada are factors that have helped boost sales of mechanical coal-burning equipment to "such a tremendous extent" that scarcely any comparison between the present and the past peak production and distribution of stokers is possible, the sales manager of a stoker manufacturer told his organization last week.

⌄

Seaboard Air Line Railway, under reorganization in federal court at Norfolk, Virginia, has been authorized to buy 13 diesel-electric locomotives. Three will be 5400-horsepower units for freight service similar to those introduced by Santa Fe for trans-continental hauls, two will be 2000-horsepower for passenger service, and eight will be 1000-horsepower for switching service.

⌄

". . . A ½-cent federal gasoline tax is just as wrong in principle as a 12-cent federal gasoline tax, and no amount of tax reduction and no amount of compromise, short of actual tax elimination, can change this situation."—Richard M. Kleberg, (D) Texas, before the House of Representatives.

ing up the mail bag thrown off the train, and rushing it at full speed to the two-horse dray which took it up to the postoffice. Without pay for the service, the youngster had come to claim it as the most important part of his daily life.

One afternoon as he grabbed the bag and started on the dead run to the dray, he collided with a visitor at the station.

Picking himself and the bag up from the ground, he yelled back over his shoulder as he completed his dash:

"White man, don't yuh know yuh is interferin' with the New Nited States mail!"

J. Elmer Thomas . . .

The oil industry is fortunate in the selection of J. Elmer Thomas as technical assistant to the chief of fuel section of the Office of Price Administration and Civilian Supply.

Regardless of what the policy of OPACS may be on price fixing, it is well to have as technical assistant a man whose knowledge of the oil industry is based on more than twenty-five years of practical experience and whose integrity is not to be doubted.

Wildcat Drilling . . .

It will be surprising, if, under the prospects which face the industry, there is not a substantial increase in wildcat drilling during the next 12 months.

In many areas wildcat wells can be drilled with a minimum of casing unless the wells are productive.

In addition to this factor, it seems likely that the tax situation will favor wildcat drilling.

And on top of all, both the government, and the oil companies themselves, are desirous that reserves be maintained at as high a level as possible. Evidences of an increasing wildcat campaign already may be seen.

During the past week, the industry pursuing its unabated search for new sources of crude supply added nine new oil producing fields and one new gas area, while new oil zones were uncovered in seven producing fields. In addition oil wells provided sizeable extensions to 12 pools. A California test stopped less than 400 feet short of the world's record, first drilling 40 feet below bottom of the second deepest hole without significant results.

Let's Not Sabotage Progress

THE oil industry has been quick to cooperate with the government in the emergency necessity of protecting its properties against possible sabotage. At the insistence of the FBI, steps have been taken by most concerns to avoid the danger of questionable persons gaining access to properties where subversive actions might easily upset or retard parts of the defense program. Employes are enthusiastically assisting in these protective measures and have submitted to finger-printing and other methods assuring adequate identification. In addition, strict regulations have been prescribed to control the release of information concerning technical developments as well as the indiscriminate taking of photographs at vital points. This is as it should be, and when the situation becomes more serious even greater precautions will be required.

However, there is a noticeable tendency on the part of some to "blackout" completely the release of information on operating developments, developments that could be of no possible value to the enemy, and if this trend should be followed, generally, the ultimate result would prevent the free exchange of ideas, and that would work to the injury of the industry. Any restriction of the flow of technical and engineering information would immediately lower efficiency and that at a time when general application of new technique and modern practices would be necessary if the industry is to meet the demands that will be placed upon it.

Oil has reached its present outstanding position among American industries only through close cooperation between its various elements and the general exchange of technical and engineering information. As quickly as improved technique or practices have been developed, the facts have been published and the benefits thus made available to the industry at large.

Under the impetus of this open-forum policy progress has been phenomenal and the industry has been able to meet every requirement that has been placed upon it.

In the present emergency the industry is blessed with ample reserves for any contingency and it has the facilities adequately to serve the nation's war and civilian requirements for petroleum products. But if this position is to be maintained in the face of a possible shortage of its operating equipment and materials, not to mention depleted technical staff, every effort must be made to increase efficiency and technical advancements must keep pace with the times.

It is the obligation of the industry, and each individual connected with it, to study and analyze operating procedure, to utilize every possible means of increasing efficiency and to contribute for the benefit of others new ideas that will stimulate technical progress. This will be the more difficult under existing conditions but now is no time to withdraw into a shell.

Let's not sabotage progress.

Need For Fairness

CRITICISM is being directed against some members of OPM and against some industries because it now appears that statements they made last year as to the ability of certain industries to furnish basic commodities may not prove up.

In some instances their judgment and their integrity are under fire.

It is true that foremost in the ranks of the accusers are some who have become fairly well known for their leanings toward "planned economy"—an Americanization of the more sinister sounding words "socialized state."

In connection with the accusations being made, it might well be asked if these basic industries or their spokesmen were informed at the time they made their estimates, as to what the government's program would require of their industries.

Did they make their estimates of plenty at a time when there was every reason to assume that in view of prospective demand, there would be plenty—and has the constantly expanding demand, based on new conceptions of needs not known yesterday, put on these basic industries burdens which neither the government nor the industries dreamed of when the roll call of industry was made to determine its state of preparedness?

We do not recall reading warnings from the government in those days between Munich and the fall of France, to build up stocks. If anybody knew of the need of building stock piles, it must have been our government.

Let us be fair in this matter. Both government and industry have had thrust upon them a task of such proportions as neither has faced before.

No doubt there should have been better plannings on the part of all—if the storm signals flying in Europe for several years had been properly interpreted and heeded. But they were not heeded, and now is no time for socialistically minded "hangers on" of the New Deal to blame industry for something which is no fault of industry or its spokesmen.

Washington Roundup

Oil moving to East via tank cars . . . Tankers commence increasing load limits . . . Government may transfer more tankers to Britain . . . Ickes asks governors to lead oil use curtailment . . . Equipment suppliers seeking priority ratings

By B. F. LINZ, Washington Correspondent

OIL began to move into the Eastern States last week by rail in sizeable quantities, and such shipments were expected to increase as lower freight rates loomed and Coordinator Ickes continued to press companies to speed up tank car movement. The Eastern supply situation was further relieved during the week by tankers commencing to increase their carrying capacities under the new load limitation law, and by the appearance of the first tanker transferred from Pacific-Atlantic coast service to Gulf-Atlantic duties.

Another cheering note was sounded July 11, when it was announced that the Senate Committee would take up the Cole pipe-line bill July 14 and that, if it was decided to give it a favorable report, it would be brought before the Senate for action the same day. The measure was unanimously approved by the subcommittee in charge of it last month. Failure of the Senate to act has been the subject of protests from several federal departments, it was disclosed.

However, officials in Washington viewed the situation with increasing concern, as it became evident that pipe-line relief for the industrial East was far in the future because of time required for construction and failure to work out a program agreeable to all companies. Another jarring note was seen in reports that steel companies would be unable to give quick delivery on pipe for new lines and might be unable to furnish anything larger than 16-inch pipe for the projected Texas-East Coast lines.

At the same time, there were indications that the government is restively awaiting the easing of the Atlantic Coast situation so as to transfer more tankers. Officials refused to discuss this phase, but there were pointers that the "battle of the Atlantic" would necessitate further shifts of shipping, including oil carriers, in the near future.

It is understood that the Maritime Commission was planning the transfer almost immediately of another 50 tankers which were not to be put in the British "shuttle" service, as were those previously diverted, but were to be used in transatlantic service to carry oil to Empire destinations. This proposal was being attacked strongly.

Meanwhile, state campaigns to cut oil product consumption were urged upon the governors of 16 East Coast states last week by Coordinator Ickes. His contention that voluntary adjustment of automobiles and conservative driving habits would conserve 20 percent were held in some quarters as being impossible to achieve.

Of importance were efforts of oil well and refinery equipment manufacturers to obtain priority ratings so the industry's development could be continued without interruption.

Completion of the industry committees which the coordinator promised to announce immediately was still held up, without explanation for the delay other than that there were many names to be canvassed.

Outlook for the coming week: Anonuncement finally of the several hundred men who will serve on the regional committees; a possible drive to get action on the Cole bill from the Senate Interstate Commerce Committee; abandonment of all efforts of the Office of Production Management to deal with the oil industry in line with Ickes claim to sole control, and steps by the OPM to assure priority for steel for pipe lines.

Tank Cars Pressed Into Service

Approximately 4000 tank cars, one-fifth of the number estimated to be lying idle on railroad tracks, already have been put into service to carry oil to the East Coast, according to reports received during the week by Ickes.

Responding to his plea to use this transportation method to make up some of the deficiency of supply occasioned by the tanker transfer—but without passing the additional cost of transportation on to the public—a number of the supplying companies have inaugurated rail movement from inland refineries reached by pipe and barge lines from producing areas.

The situation, however, still did not suit Ickes, who is pressing the companies to speed up the turnaround.

"The principal bottleneck in petroleum tank cars today is the habit of taking too much time in unloading, and the failure to return cars promptly," he asserted. "If tank cars are to make their full contribution to national defense, the efficiency of their operations must be increased. The reservoir of surplus tank cars is diminishing and cannot be relied upon to meet the anticipated needs for rail transportation.

"Until the present emergency came upon us, the supply of tank cars was so greatly in excess of needs that those who received petroleum supplies by rail were in the comfortable position of not having to hurry," he explained. "As a consequence, many tank-car users became careless as to the time taken in loading and unloading. Other dilatory habits were acquired during the years of excess tank-car supply. All of these habits must now be broken and shippers, consumers and the railroads must

work together to eliminate all avoidable delays in tank-car movements if our present equipment is to serve effectively the defense needs of the present emergency.

"It is unsafe to assume, as some persons are doing, that there is a sufficient number of surplus, or idle, petroleum tank cars to take care of our emergency needs."

The railroads of the country have enough surplus tank cars to replace 50 tankers, but many of the refineries on the Atlantic Coast do not have the faciilties to receive shipments by rail, it was pointed out last week by John C. deWilde in a review of the transportation situation for the Foreign Policy Association.

At the same time, deWilde warned that the railways do not have enough cars to transport anywhere near the volume of oil and oil products that ordinarily move by water, as shown by the fact that in 1939 coastwise tankers carried 106,761,000 net tons of petroleum and its products, as compared with 60,057,437 tons transported by rail.

Accordingly, he held, the eastern seaboard will have to rely more heavily on pipe lines, and if plans for the Baton Rouge-Greensboro line and two lines projected by oil companies from Texas to New York City and the Jersey coast go through, they would take the place of about 140 tankers. However, he said, these lines could not be completed in less than 12 to 15 months.

Tanker Capacity Boosted

Ickes also disclosed that tanker operators will take immediate advantage of the greater carrying capacity permitted under the recently-enacted legislation for relaxation of load-line requirements. The regulations for application of the new law have already been issued by the Department of Commerce.

Tanker operators were spurred to action by Davies in a telegram dispatched when the measure was signed by President Roosevelt, suggesting that they take immediate steps toward carrying the increased loads which are to be permitted.

The heavier loading of the tanker fleet, it is estimated, will increase deliveries along the Atlantic Coast by 30,000 to 40,000 barrels a day.

First tanker to leave port with a new load-line was the "Magnolia," sailing July 8 from Beaumont, for Portland, Maine. This vessel, which under the old regulations could carry only 124,000 barrels of gasoline, had a cargo of approximately 130,000 barrels, Secretary of Commerce Jesse H. Jones reported.

Two days after the new law became effective, new load lines for 70 tankers were ready for distribution to the operators and more than 200 applications had been received. To speed up the change, provision has been made that the new lines can be applied as the vessels arrive in port at either end of a voyage.

Latest available statistics of the department indicate that as of June 30 a total of 231 tankers were engaged in the Atlantic and Gulf trade.

First of the three tankers to be shunted from the Pacific-Atlantic to the Gulf-Atlantic service completed its first voyage this week, when Standard Oil Company of California's 100,000-barrel W. H. Berg reported in.

Two other tankers which heretofore carried oil from California to the East Coast are to be put on the Gulf-Atlantic run under an agreement reached last month with Standard and Sun Oil Company.

It is estimated that the three vessels will carry approximately 9,000,000 barrels of crude annually from the Gulf fields to the Atlantic seaboard, in contrast with 4,000,000 barrels which they carried on the California-East Coast run.

Pipe Line Troubles

Possibilities of quick construction of pipe lines to relieve the straitened circumstances on the East Coast faded during the week, even if the Senate takes prompt action, as reports indicated that several months will be required for the fabrication of pipe ordered by Plantation Pipe Line Company for its Baton Rouge-Greensboro line.

Although steel for the pipe lines that are to be built will be given an A-1 priority rating, considerable time will be required for its production and delivery.

Because of the difficulty of securing pipe, there is now some question whether the proposed Texas-East Coast 20- to 24-inch line will actually be of the capacity originally planned. Interests in Washington believe that 16-inch pipe may be used instead, because of the limited capacity for turning out pipe of larger diameters.

The problem is due to be considered during conferences which OPACS is holding with representatives of the leading consumers durable goods industries with a view to working out methods of making civilian allocations consonant with the defense program.

It will be the policy of the civilian supply allocation division, once the amounts of scarce materials available for civilian use are ascertained, to allocate sufficient amounts, if possible, to take care of all essential public services such as transportation, power and health. Included in these uses would be oil and gas pipe lines.

More Tanker Transfers

Should additional tankers be requisitioned and used to move oil to England itself, as is expected they would be, the transfer would have to involve a change of registry to a foreign flag, because of the prohibitions of the Neutrality Law against American flag ships traversing the war zone.

The plan is said to have been temporarily held up when a flood of vehement protests came from interests which would be affected, particularly, it is understood, from Standard Oil Company of New Jersey, which stood to lose a number of vessels.

Transfer of another 50 ships from the Gulf-Atlantic route would leave the industrial East with only little more than 60 percent of its normal delivery capacity.

Committee Appointments

The grapevine has it that Ickes is delaying announcement of the appointment of the industry regional coordinating committees because of charges that major companies were attempting to dominate them. It was reported that the list was ready for announcement as early as July 10, but that the coordinator was pressed for time and could not then give them consideration. More than 6000 names are said to have been submitted.

Few details of the proposed regional set-up have leaked out, but it is known that the field office in each region will be headed by a deputy coordinator whose title has not yet been decided upon, aided by a counsel and having the services of a considerable staff. The regional offices will begin operations as quickly as they can be named,

AHEAD OF THE NEWS

TANKERS: As a part of a general plan to alleviate the transportation situation caused by the diversion of coast-wise tankers to British service on government order, plans are being discussed to build at least 36 large and fast tankers at Pittsburgh, float them down the Ohio and Mississippi rivers without superstructures, and put the superstructures on at Gulf ports.

As the week closed rumors were current that the "Pittsburgh tanker" plan was encountering certain snags. The plan apparently is not beyond the embryonic stage and there was no certainty that it would go through or be discarded.

Cost of the project, which would be borne by oil companies engaged in coast-wise shipping from the Gulf to Atlantic seaports, would be from $100,000,000 to $110,000,000 for the first 36 tankers, which would include cost of the yards.

When Secretary Ickes held his first meeting with company representatives it was proposed merely to build tankers, and it was naturally thought that they would be built in seaboard ship yards. At the second meeting with the Co-Ordinator's office, at which Deputy Co-Ordinator Davies presided in the absence of Secretary Ickes, the plan was changed on the suggestion of Howard Pew of Sun Company, who pointed out that seaboard ship yards were filled to capacity, and that investigation had indicated to him that Pittsburgh would be an ideal point at which to build the vessels. The Maritime Commission was reported to be in agreement on this idea.

Briefly, reasons for preference of Pittsburgh over the seaboard where new yards would have to be constructed are these:

There is adequate frontage on the Ohio at Pittsburgh for the necessary yards. Immediately adjacent are fabricating plants, many of which have little or no government orders. Railroad transportation of plates, etc., would thereby be cut to a minimum. Adequate labor, already housed, is to be found in Pittsburgh.

Locks on the Ohio are 110 feet by 600 feet, large enough to accomodate the tankers. One bridge on the Ohio would interfere with superstructure on the tankers, but masts and superstructures could be put on at Gulf ports. The tankers would be finished, except for superstructures, have machinery installed in them, and, by means of temporary pontoons which would give them an even draft of 7 feet, could be floated down, controlled and propelled by tugs. Minimum draft of the river is 9 feet.

The tankers would range from 14,000 to 18,000 tons, with speeds ranging from 15 to 18 knots. Such tankers should be capable of carrying 100,000 to 140,000 barrels each. The first tankers would begin coming off the ways about the middle of next year.

Thus far, so far as is known, no definite decision to procede with these plans has been made, but the proposition appears to meet with general favor.

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PIPE LINES: Prospects for construction of a government-blessed crude-oil line out of the Southwest to the Atlantic Seaboard by way of Illinois appeared bright as the week closed with representatives of a committee of executives of seven major oil companies in Salem making investigations pertinent to the line.

About the middle of the week it appeared that a proposed products line from the southwest to Atlantic Seaboard had gone by the boards, but as the week closed and the "Pittsburgh tanker" project seemed to have hit an undisclosed snag, the products line idea, supplementing the crude line, was being revived. However, it was being proposed to build a smaller products line than the originally discussed 225,000-barrel line, a 175,000-barrel line being involved in the revived and revised plan. Thus far, however, there has been no indication that priorities would be certain for this products line. The Co-Ordinator appears to favor the crude line over the products line, although some companies selling heavily in the East would not be able to use the crude line, due to lack of refining capacity there.)

The representatives at Salem include employees of Sinclair (Consolidated) and Cities Service. The seven major companies involved in the proposed line are: Standard Oil Company of New Jersey, Socony-Vacum Oil Company, Consolidated Oil Corporation, Cities Service Oil Company, The Atlantic Refining Company, Sun Oil Company and Tide Water Associated Oil Company. All have heavy refining capacity on the Atlantic Seaboard.

The crude line would be a 200,000-barrel-per-day-capacity line from East Texas, running up through the Mississippi Valley, and crossing the river at Cairo, thence east to a point near Salem. At Salem it would be joined by stub lines connecting with 50,000 barrels per day capacity in Sinclair Refining Company and Ajax Pipe Line Company lines which would feed into it Oklahoma and Kansas crude. From Salem, by way of Dayton, Colombus, Pittsburgh, and thence to Atlantic Seaboard, it would be a 250,000-barrel-per-day

[*Continued on opposite page*]

and the committees immediately will be called in for preliminary conferences at which their responsibilities and duties will be outlined.

No decisions as to the location of regional offices appeared to have been reached, other than that the Rocky Mountain regional office would be in Denver.

Lower Freight Rates

Lower freight rates on rail shipments of oil were in sight last week as major company traffic managers and railroad officials negotiated possible "trainload" rates from western points to eastern destinations.

The companies, it was said, were attempting to avail themselves of the opening for such rates created recently by the Interstate Commerce Commission in a decision permitting train-load rates on blackstrap molasses after having for years successfully avoided the setting of rates for anything greater than carload shipments.

Already, it was learned, oil interests in the Mid-Continent field have filed an application for trainload rates on gasoline to eastern destinations.

Last month, the ICC issued an inconclusive decision reducing pipe-line rates over the Buckeye Pipe Line from Oklahoma, western Louisiana, East Texas and Arkansas to Martinville, Indiana, and Lima, Ohio, with an idea of expediting the movement of crude to the east, just before announcement by Standard Oil Company of New Jersey that it would move oil from Lima to its Bayway and Bayonne, New Jersey, refineries by rail.

Consideration of lower rail rates was instigated by Ickes July 3 at a conference with officials of 24 federal agencies interested in oil, when he asked ICC Chairman Joseph Eastman to study the possibilities of reductions in the form of "emergency rates" on oil from the interior to eastern destinations during the period of shortage.

Ickes Ask Rationing

Governors of 16 states from Maine to Florida were asked by Ickes July 9 to lead, in their respective states, "a voluntary effort" having as its aim a reduction in the consumption of petroleum products by at least 20 percent.

Accompanying his letters to the state executives were copies of the

conservation program which has been adopted for the District of Columbia, showing many ways in which oil products can be conserved.

Unless the effects of transportation deficiencies can be offset, Ickes warned, the impending shortage will "cause a serious setback in our national defense efforts and also result in much inconvenience and discomfiture to the people generally."

"While we have taken many steps to avert the impending shortage, our reserve stocks on the East Coast are now being depleted rapidly," he wrote.

"Our essential problem is one of transportation. The transfer of 50 tankers to the British shuttle service, and the diversion of others to the use of the American Navy, have made heavy inroads on the Atlantic Coast's customary means of receiving petroleum products. We are endeavoring to overcome this transportation deficiency by every possible means.

"It is apparent, however, that immediate steps must be taken as pipe lines and new tankers cannot be built overnight. Voluntary rationing is an immediate step that can be undertaken.

"A 20 percent reduction, such as I hope can be brought about voluntarily, in the use of petroleum products in your state, as well as in the other Atlantic Coast states, will do much to meet the emergency."

Driving Savings Questioned

Ickes' contention that proper adjustment of automobiles and conservative driving habits could bring about a 20 percent saving in gasoline was dealt a serious blow last week by the National Bureau of Standards, which reported that while considerable quantities of gasoline can be saved, nothing like the proposed 20 percent reduction can be accomplished.

"This fact has been amply demonstrated by a series of cooperative tests which are being conducted by experts of the bureau and representatives of the American Automobile Association," it was declared.

"While recognizing the need for conserving gasoline in the face of a threatened serious shortage of petroleum in the eastern part of the country, and commending all serious efforts along that line, the

AHEAD OF THE NEWS

[*Continued from opposite page*]

line (24-inch). Naturally priorities for pipe and the equipment on the line would be necessary.

However, the work now being done is simply preliminary, and no work beyond that of planning will be attempted until passage of the Cole bill. This bill provides not only the right of eminent domain for such a line, but certain immunity from prosecution under the Elkins act, which must be had before the oil companies would be willing to undertake the joint line. (Oil company owenership of pipe lines, now looked on with favor by the government, was made partial basis of an anti-trust suit against these very oil companies, only a few months ago.)

The proposed line would be financed by the oil companies, its $70,000,000 cost being amortized under the Cole bill, in five years. It would require about a year to build the line, and of course priorities on pipe and auxiliary equipment would have to be made available.

Plans for this line are the outgrowth of meetings between oil company executives and representatives of OPM and later Co-Ordinator Ickes and Deputy Co-Ordinator Davies.

At these meetings it first appeared that the preponderance of opinion favored a 225,000-barrel products line from near Shreveport to the Atlantic Seaboard. In the meeting between representatives of major companies and Davies on June 26, minimum commitments of 165,000 barrels daily for a products line, with prospects for additional commitments, were made as follows: Standard Oil Company of New Jersey, 40,000 barrels; Socony-Vacuum Oil Company, 40,000 barrels; Gulf Oil Corporation, 40,000 barrels; The Texas Company, 30,000 barrels; Shell Oil Company, 20,000 barrels. The crude line was backed by Consolidated Oil Corporation with 40,000 barrels a day commitment, Cities Service Oil Company, 40,000 barrels, and Tide Water Associated Oil Company with 20,000 barrels a day. Other companies said they would commit themselves to use the line if certain other things were not done.

Standard Oil Company of Ohi and Ashland Refining Compan opposed the routing of a products pipe line through their territories because of possible effect on their business after the emergency is over. On the other hand they favored routing of a crude line through their territories. Two weeks ago it looked as though the products line, and not the crude line would be built. However, meetings of oil company executives held in New York after June 26 brought the companies more closely in line on what they desired. Harry Sinclair, of Consolidated, who had talked with Secretary Ickes just prior to the June 26 meeting, suggested that instead of a 250,000-barrel crude line from Texas to the Seaboard, the line be built to take 50,000 barrels a day out of Oklahoma and Kansas. He was backed up by wires from operators in the upper Mid-Continent, and Ickes thought well enough of the proposition to suggest its consideration. It now appears that the Sinclair plan will be included in the crude-line project.

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TANKER BUILDING PROGRAM. Here is a summary of tanker construction in the United States during the remainder of 1941 and 1942:

Private ownership for use in coastwise service unless diverted by government order, 18 tankers scheduled for delivery between April 15, 1941, and January 1, 1942. This program is running ahead of schedule.

Private ownership for delivery in 1942, 37 tankers which could go into coastwise service unless diverted.

Private ownership for delivery in 1942, already ordered, 37 tankers.

Private ownership, proposed but not yet ordered, an additional 36 tankers, to be built at Pittsburgh for delivery at the rate of three per month beginning with second half of 1942.

For Maritime Commission, already ordered, for delivery at rate of 4 per month beginning in November, 1941, a total of 72 tankers.

In addition to the foregoing, ship yards have contracts for delivery to private ownership in 1943 for 10 tankers.

Most of the tankers will run around 100,000 to 140,000 barrels carrying capacity with speed of 15 to 18 knots.

In studying the above, and not allowing for unusual speed-up in construction, it appears probable that by August 1, 1942, there will have been added to the United States tanker fleet in excess of 80 tankers, all of more than average size and speed, capable of moving 408,000 barrels per day from Gulf Coast to Atlantic Seaboard ports.

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COMMITTEE: Announcement on the personnel of the advisory committees of oil men in process of being appointed by Co-Ordinator Ickes and Deputy Co-Ordinator Davies will not likely be made for ten days to two weeks. These committees will assist the Co-Ordinator with information and advice.

experts are disposed to take a realistic view of the problem as a whole.

"In connection with suggestions that a ban be placed on Sunday driving, statistics are said to show that probably 60 percent of weekend operation of automotive vehicles can properly be classified as business or necessary transportation. On other days of the week, the percentage of pleasure driving is much smaller."

Better results could be achieved, it was said, if the government itself reconverted to coal power and heating units which in recent years have been switched from that fuel to oil. Savings also could be made by farmers returning to the use of coal or wood for cooking installations originally designed for those fuels but converted to use kerosene.

A statistical survey by the Bureau of Foreign and Domestic Commerce during the week disclosed that manufacturing establishments in 33 industrial areas, mostly in the East, consumed 88,483,231 barrels of fuel oil in 1939, or 66.1 percent of the fuel-oil consumption of all the manufacturing plants of the country. This figure compared with 58.7 percent of all consumption in 1929.

Leading all other sections was the New York-Newark-Jersey City area, with a factory fuel oil consumption of 17,572,789 barrels, the bureau said. The Philadelphia-Camden area consumed 12,149,037 barrels, and the Chicago area 10,993,393 barrels.

Priorities

Manufacturers of well and refinery equipment have initiated a movement to have the Office of Production Management establish a regular priority rating for their products, to eliminate delays in deliveries which already have been experienced in a few instances.

It is pointed out that while the equipment industry receives special priority treatment in some cases, it does not have the advantage of a regular priority rating, although it is recognized as essential under the national defense program.

In general, it was admitted, there has been little difficulty experienced by producers or refiners in securing needed supplies, but it is pointed out that the restrictions which are being applied to metals and other raw materials may bring about a serious situation if the industry is not protected.

Particularly affected by the defense restrictions is the steel supply, and manufacturers are fearful of a shortage of steel drums and metal containers for lubricating oil unless priorities are granted.

OPACS Adds Oil Experts

Completion of organization of the fuel section of the price division of the OPACS last week brought the appointment of J. Elmer Thomas, Fort Worth petroleum analyst, as advisory consultant to Section Chief Quinn Shaughnessy.

Thomas, who has had 27 years of varied experience as a petroleum geologist and economist and as an independent oil operator, will have as his first responsibility the organization of a staff of technical experts drawn from the oil, gas and coal industries.

J. ELMER THOMAS

newly appointed advisory consultant to the fuel section of the OPACS is an independent operator and geologist. He is a member and past president of the American Association of Petroleum Geologists, a member of the American Institute of Mining and Metallurgical Engineers; and a member of the American Association for Advanced Science. Thomas served as chairman of the committee on petroleum economics for the Federal Oil Conservation Board in 1930, and as special technical advisor to the NRA oil administrator (Ickes) and member of the Petroleum Administrative Board in 1933.

His professional positions have been: Mining Geologist, American Smelting & Refining Company, Sierra Mojada, Coah., Mexico, 1912-1913; Petroleum Geologist, Minnehoma Oil Company, Oklahoma, 1914-1915; Chief Geologist Chicago Oil Company, 1915-1916; Chief Geologist, Sinclair Oil and Gas Company, 1916-1917; Chief Geologist Chicago Oil Company, 1917-1918; 2nd Lieutenant, United States Army, Air Service, Photographic Branch, 1918; Consulting Geologist, San Antonio, Texas, 1919-20; Consulting Geologist, Chicago, Illinois, 1920-1925 (Chief Geologist, Shaffer Oil & Refining Company, 1921-1924); Independent Oil Operator and President, Thomas Petroleum Corporation, Fort Worth, Texas, 1925-1928; Petroleum Analyst, Fenner & Beane, Members New York Stock Exchange, New York-Fort Worth, 1928-1930; Oil explorations in Western Europe, 1930-1933 (Vice-President and General Manager, Bavarian Oil & Gas Co.); Independent Oil Operator and Consulting Petroleum Economist, Fort Worth-Houston, 1933 to date.

A number of experts have been brought into the OPACS for temporary service, including Allen F. Hand, Los Angeles, active for many years in the California branch of the industry; Alden W. Foster, Pittsburgh consulting geologist specializing in gas properties; Joseph Gordon, New York, petroleum economist for the investment firm of Fenner & Beane, and Robert N. Moore, Decatur, Illinois, central states distributor of oil products.

Stripper Well Plea

The case of the "stripper" wells —the wells yielding small amounts of oil each day but together accounting for about 20 percent of the total proved underground reserves in the United States, has been outlined to Petroleum Coordinator Ickes by Charles P. McGaha, president, and H. B. Fell, executive vice president, of the National Stripper Well Association.

In their statement the two association officers mentioned that it had been "suggested by some" that if 50,000 stripper wells were abandoned there might be a beneficial result as the steel and other materials salvaged could be used in new wells or in national defense purposes.

"It must be recognized," wrote Messrs. McGaha and Fell, "that such steel as might be salvaged from wells of this type is in most cases badly deteriorated and what is usable could, in most cases, only be utilized in very shallow wells as it is to light to use in deep wells."

That point—recovery of the material from abandoned wells—is inconsequential in comparison with the principal loss that would occur in natural resources, they said. ". . . it would seem absurd in the critical situation that now confronts our nation to abandon large known reserves in the hope of finding new reserves which are becoming increasingly difficult to recover," the association officials asserted.

The economic point stressed to the co-ordinator was that an adequate price is necessary to the continued operation of the small wells.

Second-Half Forecast Complicated by Many Factors

By RAY L. DUDLEY, Publisher

AMERICAN occupation of Iceland may have a material effect on the oil situation in the United States. The occupation and the President's orders to the Navy indicate that the American Navy will convoy ships, including tankers, at least part way across the Atlantic, thereby allowing the British Navy, with shortened lines, to do a better convoy job, that a better convoy job should reduce sinkings and expedite movement of supplies, including oil, seems obvious. Offsetting this gain, however, is the possibility of Germany waging an undeclared, or a declared war against American shipping whereever it may be found, which in turn might jeopardize shipments from the Gulf Coast to the Atlantic Seaboard on the vessels left in that service.

It is now reported that only 42 tankers, instead of the 50 previously reported, have been diverted by the government from the coastwise service into British service.

In addition to the factors enumerated below, there are many more in process of being worked out which should materially alleviate the transportation of petroleum from producing and refining areas into the great consuming areas of the Atlantic Seaboard. Some of these factors are discussed elsewhere in this issue.

Texas, New Mexico and Louisiana Area

It does not seem unreasonable to believe that despite the tanker situation, demand for crude from Texas, Louisiana and New Mexico, will continue to increase during the summer and production will show material increases. In fact, it can be figured out that despite proposed curtailment of Eastern consumption because of decreased tanker shipments to Atlantic Seaboard from this area, production during the second six months of the year will be substantially larger than for the first six months.

By trying to piece together parts of the picture, with still another minor part, it is possible to get a faint outline of what demand may be. The Bureau of Mines took this into consideration in its latest allocations when it said, two weeks ago with reference to allowables in Texas and Louisiana, that "the ultimate change in market demand for crude supplying the Gulf Coast and East Coast areas will depend upon the speed with which transportation re-adjustments become effective and upon the extent to which the diverted tankers may move products directly from the Gulf Coast for British use or for our own increasing naval requirements."

It is possible to get almost as many answers to the question of the effect of tanker withdrawals as there are people studying the problem!

Here are some of the factors involved:

The diversion of 42 tankers (the new figure) reduces the movement of crude and refined products from the Gulf Coast area to Atlantic Seaboard by approximately 168,000 barrels daily. (The average of 4000 barrels per day per tanker in service between Gulf ports and the Atlantic Seaboard, the figure used by the A.P.I. fact-finding committee a few weeks ago, being used.)

Offsetting this loss of 168,000 barrels per day carrying capacity are the following items which either have already been put into effect or can be put into effect immediately:

Re-allocation of half of the 42 tankers to move oil from Gulf Coast to convoy point for England, 64,000 barrels daily. (One company estimated a higher figure.)

Increased loading on remaining tankers in coastwise service (3 percent increased loading per tanker on the average), approximately 40,000 barrels per day.

Increased efficiency on loading and unloading in coastwise service, and in speeding up tanker schedules, approximately 60,000 barrels per day (one company's estimate).

New movement, of recent weeks, by pipe-line from Texas to Atlantic Seaboard, approximating 30,000 barrels per day.

Transfer of Sun Oil Company-

Standard Oil Company of California tankers from California to Atlantic Seaboard, 25,000 barrels daily.

Total of the above amounts to 219,000 barrels as against loss of 168,000 by diversion of tankers to British service.

In addition 560,000 barrels of No. 2 heater oil will be moved to storage by United States Naval vessels shortly.

Added to the foregoing analysis of the Gulf area situation, should be additional movements out of the Texas-Louisiana-New Mexico area by tank cars and an increased consumption of products in those areas.

California Area

California stands to lose 11,000 barrels daily movement to the Atlantic Seaboard by reason of diversion of tankers to Gulf Coast service. Added to this is the uncertainty of the Japanese movement, and offsetting it in part will likely be materially increased industrial, naval and army consumption on the West Coast and United States possessions.

Upper Mid-Continent Area

It appears likely that all available transportation facilities, including tank cars, will be put to work out of Oklahoma, Kansas, Arkansas and Northern Louisiana. Gulf Oil Corporation for some time has been moving 10,000 barrels per day additional oil from this area through its pipe line system to the East. Oklahoma and Kansas allowables have been stepped up to such point that Oklahoma has been taking oil out of storage.

Illinois Area

Illinois production has been stepped up in agreement with increased demand in the trade area served by the Illinois fields. In spite of benefit of the opening of some new fields, Illinois storage, also, has been growing smaller, and there seems a likelihood that Illinois production will see no curtailment except for such strictly conservation measures as may from time to time be necessary.

Rocky Mountain Area

There seems no likelihood of any curtailment of demand in the Rocky Mountain area and the production at least throughout the summer should show an increase.

Drilling Prospects for Second Half

Drilling prospects for the second half of 1941 in the United States are tied up very closely with the pipe and oil equipment situation.

There is a very serious situation in the pipe market which will likely grow more acute during the next several weeks, or possibly even months.

Most of the major companies are reported to have at least three months' pipe supply on hand. Two are reported to have much more than three months' supply. Pipe stocks in Memphis and Houston yards, which have in the past served the Mid-Continent and the Gulf Coast areas, is down to the very minimum, having shrunk from 195,000 tons to less than 25,000 tons in a recent two-weeks period.

The mills, incidentally are pretty well booked ahead for several months. One large pipe company is reported to be running one of its mills only part time because of inability to get steel to roll.

No Immediate Drilling Curtailment

However, in the face of the situation just described, which is particularly hard on small operators, it appears that at least for the next three months there will be no curtailment in drilling, and that when curtailment comes, if it does, it will be dependent strictly on the matter of pipe and other supplies.

OPM and later Coordinator Ickes urged the industry to curtail its drilling program by at least 20 percent. It appears highly probable that such drilling in proven areas as will be done, will likely be on a somewhat wider spacing, but unless some legal provision is made whereby lease requirements can be set aside without the danger of the oil company jeopardizing its leases by failure to drill, drilling will go right ahead. And in view of the hitherto regarded "sanctity of contract" it does not seem likely that an attempt will be made by official Washington to protect oil companies against the consequences of violation of lease obligations.

General Supply Situation

While most plants engaged in manufacturing oil-country drilling and producing equipment have been able to maintain their production, great fear has been expressed by many of them that within the next few weeks they will be materially slowed down by reason of lack of steel.

This situation probably is a lot worse than most oil companies realize.

A check of the principal companies engaged in the manufacture of pumping units, some time ago, revealed that the manufacturers contacted, with the exception of one, were greatly concerned about the possibility of being unable to supply the demand which is sure to come.

A check among manufacturers of working barrels, balls and seats, showed an even worse situation. The plants checked were going right ahead with unabated production, but each one contacted expressed the fear that 60 days would see their production greatly curtailed unless they were helped with priorities which none of them had been able to secure up to that time.

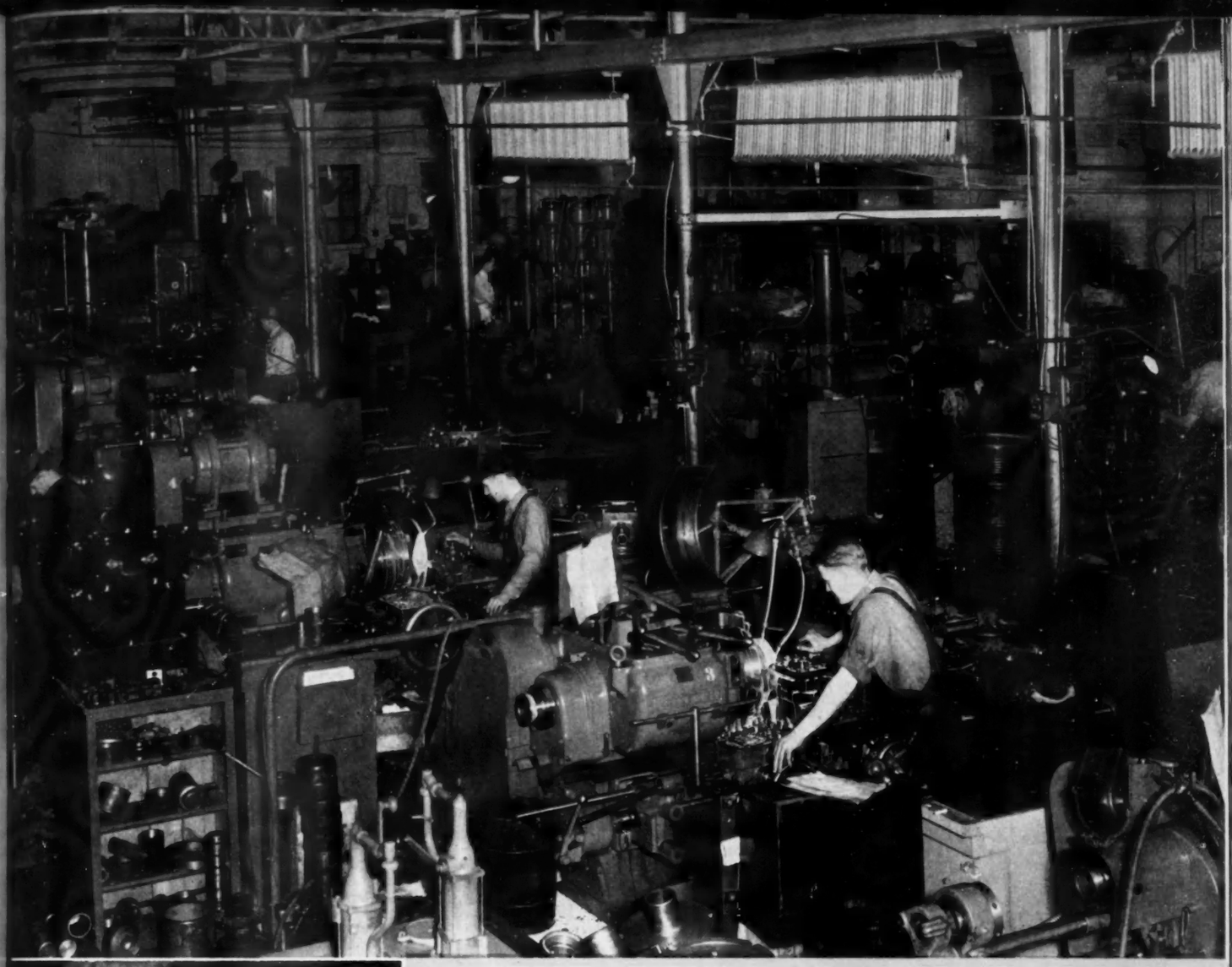
OPM, however, several days ago indicated that it proposed to provide sufficient supplies of steel to take care of replacement items, although it indicated that replacement for the purpose of improving efficiency, would not be considered. What OPM meant was that it would see to it that manufacturers would get special priorities on materials to make parts.

Summary

Production during the second half should show a material gain, not taking into consideration the probability of building up stocks in oil-country areas. During the week we heard an executive of a large company express the belief that if the transportation problem made necessary further reductions in allowables in some areas, the purchasers ought to add to storage to take care of the producer. It would appear from a standpoint of a lesson recently learned, that storage may be increased simply as a matter of protection.

While the total number of wells to be drilled in the second half of the year may be off as compared with the first half, it does not appear likely that there will be a drop for at least two or three months.

The supply situation is one in which the oil companies have a great stake and the various committees of oil men which will be appointed by the Coordinator, should keep in close touch with this situation because it will require action on the part of oil companies to make it possible for manufacturers to secure some needed materials.



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Record Demand and Moderate Stocks Make Situation Good

By L. J. LOGAN, Associate Editor

THE oil industry has entered upon the second half of this extraordinary year in a generally satisfactory position and without formidable problems, aside from transportation difficulties which have arisen because of the war and the defense program but which are being minimized through efforts of the industry, with government cooperation.

Oil companies are doing this year the greatest volumes of business they ever did, as total demand for petroleum is running higher than ever before, despite sharply subnormal exports.

Available supply, from current production, imports, and stocks, is in favorable relation to the prevailing demand, moreover, and favorable markets for both crude and refined oils consequently obtain.

Through advances since the beginning of the year, crude prices have improved to the best levels since the fall of 1938, and prices of refined products have recovered to the highest levels since the fall of 1937.

Earnings of oil companies reflect these favorable circumstances in which record quantities of crude oil are being produced and refined and in which relatively good prices are being obtained for the large volumes of crude and products marketed.

In the first quarter of this year, aggregate earnings of the industry failed to equal those of the corresponding period last year. But as the second quarter commenced, prices of crude oil and refined products materially improved, and as the period advanced, additional improvement occurred, with the result that June-quarter profits of 1941 were generally better than those of 1940. For the first six months of 1941 as a whole, earnings probably were appreciably better than those of the corresponding months of last year.

Similarly, the latter half of this year very likely will afford materially better earnings than did the like period last year, when prices of gasoline were depressed practically as low as during the depression and when markets for lubricants and some other finished products likewise were exceptionally weak.

Advances of prices of crude oil and refined products have been well in line with increases in prices of other commodities, and consequently, although the government currently is discouraging any further raising of prices in the oil industry, as well as in other industries, there is certainly no justification for any special questioning of the present prices of oils. Whereas prices of raw materials in general, as represented in the Depart-

Petroleum Demand Up Nearly 6 Percent This Year

Figures indicate barrels, and are from Bureau of Mines

	APRIL			FIRST FOUR MONTHS		
	1940	1941	Percent Change	1940	1941	Percent Change
SUMMARY—						
Total Demand	115,303,000	127,053,000	+ 10.2	471,124,000	494,124,000	+ 4.9
Daily average	3,843,000	4,235,000	+ 10.2	3,894,000	4,120,000	+ 5.8
Exports:						
Crude petroleum	4,262,000	2,503,000	— 41.3	15,837,000	7,520,000	— 52.5
Refined products	7,585,000	[1]5,900,000	— 22.2	27,659,000	21,035,000	— 23.9
Total exports	11,847,000	8,403,000	— 29.1	43,496,000	28,555,000	— 34.4
Domestic Demand:						
Total domestic demand	103,456,000	118,650,000	+ 14.7	427,628,000	465,839,000	+ 8.9
Daily average	3,449,000	3,955,000	+ 14.7	3,534,000	3,882,000	+ 9.8
TOTAL DEMAND FOR PRODUCTS:						
Motor Fuel:						
Domestic	47,683,000	55,105,000	+ 15.6	170,217,000	191,265,000	+ 12.4
Exports	2,075,000	[2]2,288,000	+ 10.3	8,517,000	7,742,000	— 9.1
Total	49,758,000	57,393,000	+ 15.3	178,734,000	199,007,000	+ 11.3
Aviation Gasoline:						
Domestic	671,000	812,000	+ 21.0	2,029,000	2,405,000	+ 18.5
Exports	410,000	[3]63,000	— 84.6	1,203,000	1,355,000	+ 12.6
Total	1,081,000	875,000	— 19.1	3,232,000	3,760,000	+ 16.3
Kerosene:						
Domestic	5,621,000	5,549,000	— 1.3	25,799,000	26,623,000	+ 3.2
Exports	399,000	180,000	— 54.9	1,573,000	519,000	— 67.0
Total	6,020,000	5,729,000	— 4.8	27,372,000	27,142,000	— 1.0
Gas & Oil Distillate Fuels:						
Domestic	11,849,000	[4]12,634,000	+ 6.6	68,121,000	71,105,000	+ 4.4
Exports	1,966,000	[5]956,000	— 51.4	7,067,000	4,379,000	— 38.0
Total	13,815,000	13,590,000	— 1.6	75,188,000	75,484,000	+ 0.4
Residual Fuel Oils:						
Domestic	26,887,000	[6]31,452,000	+ 16.9	117,671,000	128,442,000	+ 9.2
Exports	1,532,000	1,378,000	— 10.1	4,372,000	4,561,000	+ 4.3
Total	28,419,000	32,830,000	+ 15.5	122,043,000	133,003,000	+ 9.0
Lubricants:						
Domestic	2,138,000	2,172,000	+ 1.6	7,597,000	9,140,000	+ 20.3
Exports	1,161,000	775,000	— 33.0	4,511,000	8,363,000	+ 85.4
Total	3,299,000	2,947,000	— 10.7	12,108,000	17,503,000	+ 44.6
Wax (thousands of pounds:)						
Domestic	29,537	51,997	+ 76.0	101,095	155,423	+ 53.7
Exports	19,156	[7]11,933	— 37.7	94,207	49,878	— 47.1
Total	48,693	63,930	+ 31.3	195,302	205,301	+ 5.1
Coke (short tons):						
Domestic	72,700,000	86,200,000	+ 18.6	456,100,000	514,800,000	+ 12.9
Exports	27,500,000	17,000,000	— 38.2	63,300,000	53,800,000	— 15.0
Total	100,200,000	103,200,000	+ 3.0	519,400,000	568,600,000	+ 9.5
Asphalt (short tons):						
Domestic	302,000,000	385,800,000	+ 27.7	849,000,000	1,119,900,000	+ 31.9
Exports	29,400,000	23,300,000	— 20.7	91,700,000	77,800,000	— 15.2
Total	331,400,000	409,100,000	+ 23.4	940,700,000	1,197,700,000	+ 27.3
Road Oil:						
Domestic demand	190,000	192,000	+ 1.1	501,000	447,000	— 10.8
Miscellaneous:						
Domestic	156,000	193,000	+ 23.7	554,000	978,000	+ 76.5
Exports	85,000	68,000	— 20.0	462,000	205,000	— 55.6
Total	241,000	261,000	+ 8.3	1,016,000	1,183,000	+ 16.4

[1] Beginning April, 1941, data concerning shipments to and from noncontiguous territories not available. [2] Includes 11,000 barrels benzol and 760,000 barrels exported from bond. [3] Includes 5,000 barrels antiknock compounds. [4] Includes 749,000 barrels Deisel bunker oil. [5] Includes 80,000 barrels exported from bond. [6] Includes 1,871,000 barrels bunker fuel oil. [7] Includes 154,000 pounds exported from bond.

CONGRATULATIONS

FROM WAUKESHA TO CARDWELL

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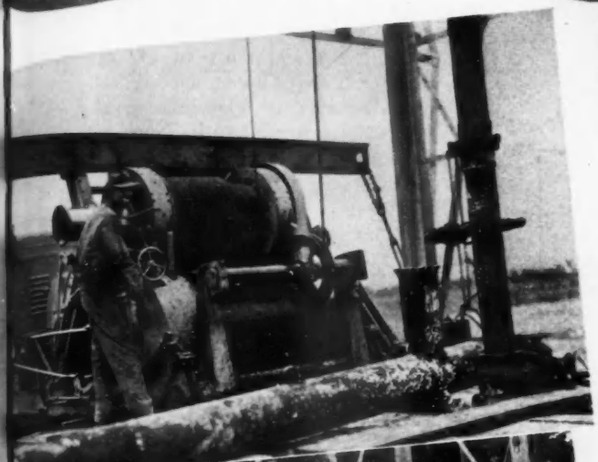

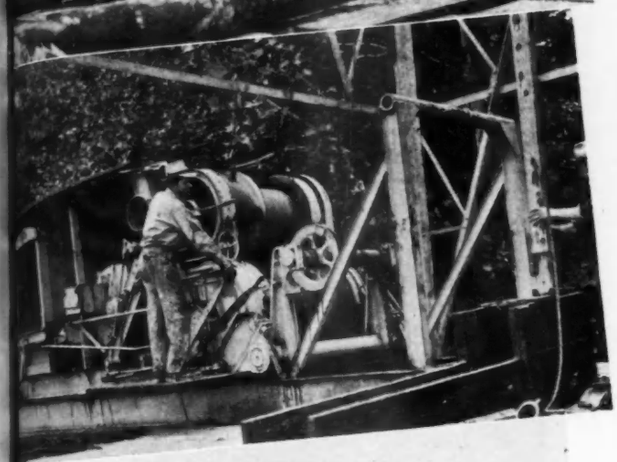

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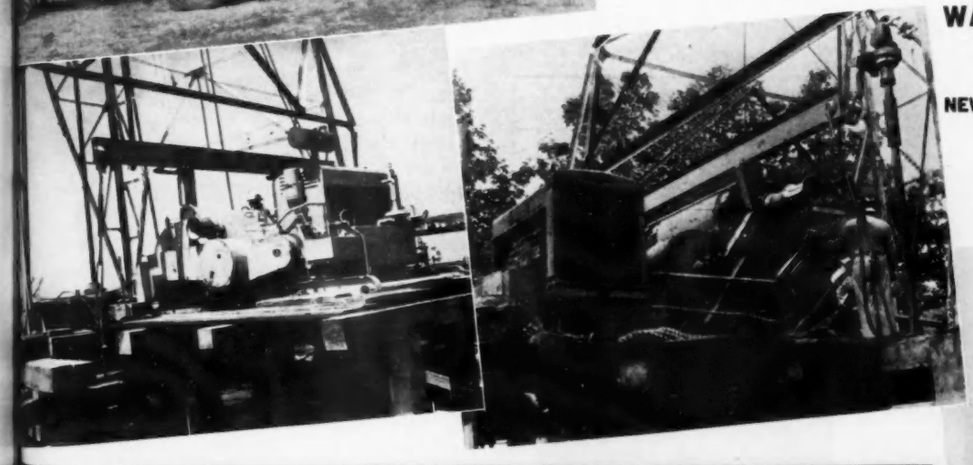
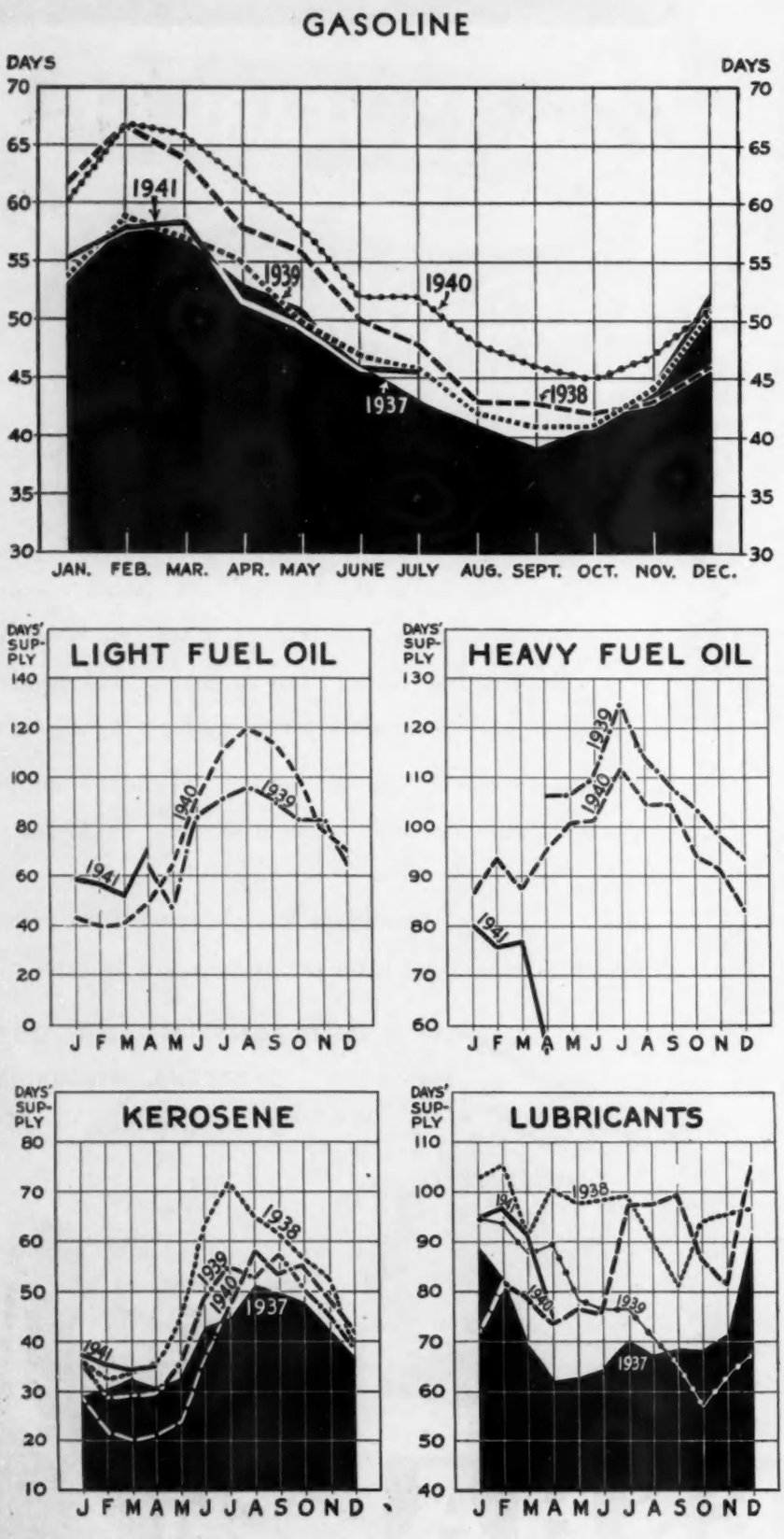


WAUKESHA *Oil Field* ENGINES

Days' Supply of Principal Refined Products in Storage

In relation to prevailing consumption, stocks of gasoline are about same as in 1937; those of heavy fuel oil are exceptionally low; and inventories of kerosene, light fuel oil, and lubricants are moderate.



ment of Labor's index of 815 commodities at wholesale, have increased 20 per cent since a year ago, crude oil has advanced only about 15 percent. And while manufactured commodities in general have increased 10½ percent, the wholesale price of gasoline to the dealer has improved only in exactly that same amount, from its seriously depressed level a year ago.

There is a possibility, in fact, that because of the government's efforts to hold down prices of crude oil and refined products, the earnings possibilities of the industry may be circumscribed. For unless the government also holds down wages and the costs of materials used by the industry, the oil companies will find it difficult or impossible to escape a narrowing of the margins of profit.

Demand Greatest on Record

Total demand for petroleum has been running this year well above any previously reached level, as unprecedented domestic consumption has more than compensated for loss of export business.

In April, latest month for which official figures on demand are available, total demand for oil was 10 per cent larger than in that month last year, as domestic consumption was up almost 15 percent, while exports were down 29 percent.

Total demand for petroleum in the first four months of this year was almost 6 percent larger than in the like months last year, on a daily average basis, with domestic use up 10 percent and exports down 34 percent.

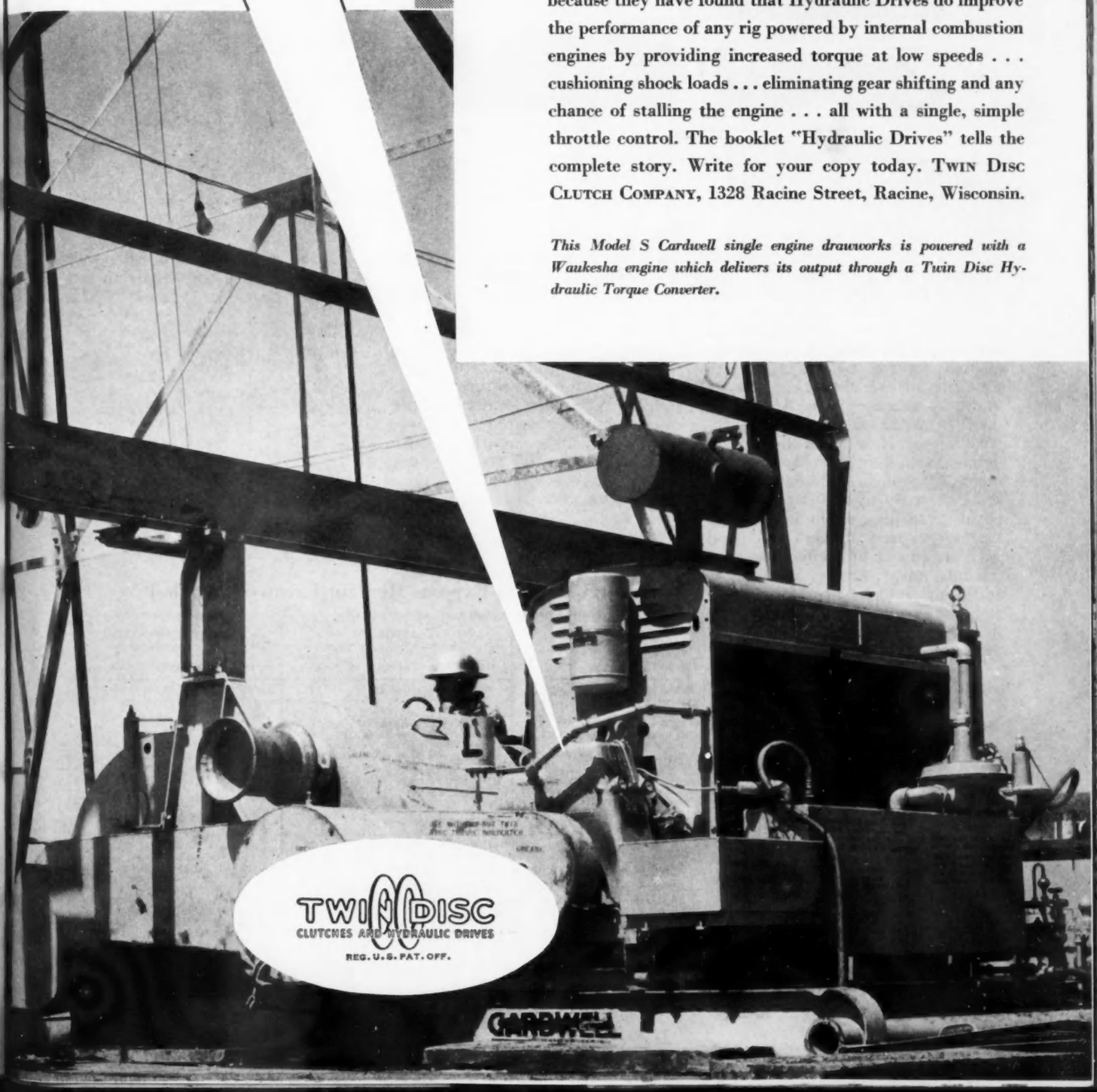
Consumption trends of the first four months of this year have been extended without radical change through May and June and into July, as evidenced by the fact that the Bureau of Mines forecast for each of the latter three months about the same gain over a year before as for the earlier months of the year in domestic demand for gasoline, principal product of the industry.

It has been recognized that scarcity of tankers for moving oils from the Gulf Coast to the Atlantic seaboard may temporarily restrict consumption in the latter region, but so far, the East Coast oil shortage has remained merely a threat rather than a reality. Various means have been used to avoid or at least postpone actual inadequacy of gasoline in the Eastern

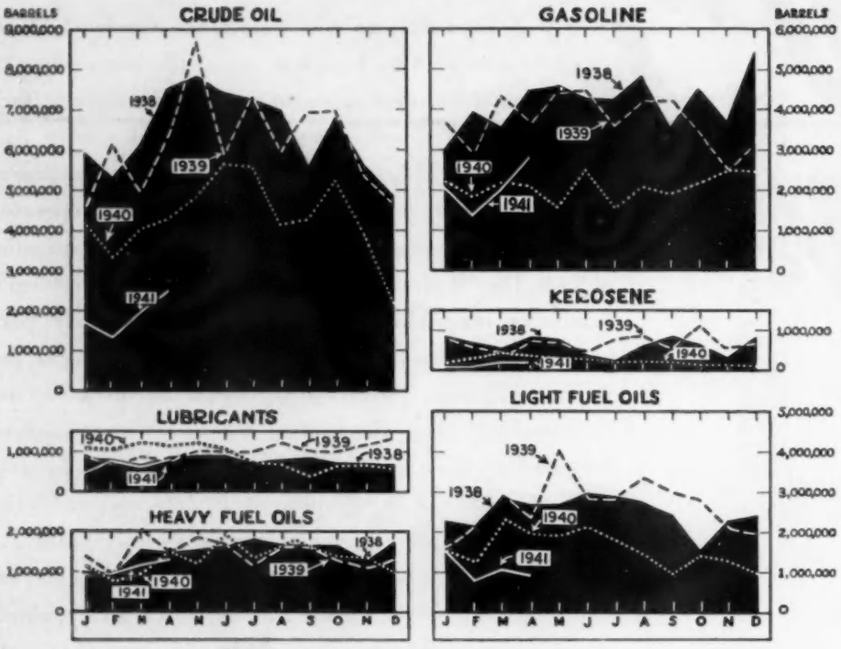
one of the first

Always alert to new trends, the Cardwell Manufacturing Co., Inc., was one of the first drilling rig manufacturers to visualize the advantages of Twin Disc Hydraulic Drives for oil field service . . . among the first to adopt this modern development. This judgment was quickly endorsed by operators in every major field who saw in the demonstration of Twin Disc Hydraulic Drives an answer to the problem of combining internal combustion engine economy and portability with the desired characteristics of steam engine performance. Today, Twin Disc Hydraulic Drives are offered by practically all of the leading drilling rig manufacturers because they have found that Hydraulic Drives do improve the performance of any rig powered by internal combustion engines by providing increased torque at low speeds . . . cushioning shock loads . . . eliminating gear shifting and any chance of stalling the engine . . . all with a single, simple throttle control. The booklet "Hydraulic Drives" tells the complete story. Write for your copy today. TWIN DISC CLUTCH COMPANY, 1328 Racine Street, Racine, Wisconsin.

This Model S Cardwell single engine drawworks is powered with a Waukesha engine which delivers its output through a Twin Disc Hydraulic Torque Converter.



U. S. Exports of Crude Petroleum and Refined Products



States, and during the past six weeks there have been contra-seasonal additions to gasoline stocks in those states. Actually, the gasoline inventory situation on the East Coast has been improved, therefore, rather than impaired. This result has been achieved, in the face of the loss of 20 percent of the industry's tanker facilities, through the transfer of 50 boats to British service, by making more efficient the use of tankers that remain, by increasing pipe line movement of crude oil from the Southwest to the New York and Philadelphia areas, by increasing shipments by tank car and barges, and more recently by the Navy's temporary returning to the industry of two large, new tankers that had been taken out of civilian use and put into naval service. Meanwhile, additional tankers are being built, and expansion of pipe line facilities between the Southwest and the East is being pushed.

The contra-seasonal building up of gasoline stocks on the East Coast has been achieved partly at the expense of coastwise movement of fuel oils, gasoline having been given precedence over the fuel oils in loading available boats, because of more immediate demand. However, through this procedure, there has been avoidance so far of any real shortage of any kind on the East Coast. And it is contemplated that heavy demand for heating oil on the Atlantic Coast next fall and winter will be similarly met when the necessity comes, for at that time, requirements for gasoline will be easing up, and available transportation facilities may then be devoted particularly to the meeting of the burning oil demand. Furthermore, some relief may be expected by then from launching of new tankers and construction of new pipe lines and barges.

There have been hints that still more tankers might have to be given up soon for British use, but the industry is hopeful that further requests will be limited to replacements of boats currently sunk, in which event the requirements might be met currently without great shock, as new boats came off the ways.

Having taken into consideration all circumstances and reasonable possibilities, leaders in the industry are generally confident that the transportation problem will not prove insuperable and that there will not be much, if any, actual curtailment of the normal movement of oils to all consumers, despite the fact that consumption is proceeding in record-breaking volume.

Changes From Year Ago in Stocks Of Crude and Refined Oils in the United States

(Figures indicate Barrels)

LATEST WEEKLY DATA

(Sources: Crude stock, Bureau of Mines; all other figures American Petroleum Institute.)

STOCKS OF:	June 29, 1940	June 28, 1941	Percent Change
Gasoline	94,298,000	91,461,000	— 3.0
Gas Oil & Distillate	33,048,000	35,732,000	+ 8.1
Residual Fuel Oil	104,344,000	92,896,000	—11.0
Crude Oil	*260,891,000	†259,142,000	— 0.7

LATEST MONTHLY DATA

(Source: Bureau of Mines.)

ITEM	Stocks at End of April 1940	1941	Percent Change
SUMMARY—			
Crude Petroleum:			
Refinable in U.S.	258,066,000	266,012,000	+ 3.1
Heavy in California	13,516,000	11,802,000	—12.7
Natural Gasoline	6,112,000	5,504,000	— 9.9
Refined Products	277,739,000	273,439,000	— 1.5
Total, all Oils	555,433,000	556,757,000	+ 0.2
Days' Supply:			
April basis	145	131	— 9.7
4 Months basis	143	135	— 5.6
PRODUCTS—			
Gasoline:			
Finished	96,615,000	88,576,000	— 8.3
Unfinished	6,112,000	5,504,000	— 9.9
Total	102,727,000	94,080,000	— 8.4
Aviation Gasoline	5,178,000	7,347,000	+41.9
Kerosene	4,351,000	7,063,000	+62.3
Gas Oil & Distillate Fuels	25,092,000	31,793,000	+26.7
Residual Fuel Oils	88,932,000	80,379,000	— 9.6
Lubricants	8,065,000	8,363,000	+ 3.7
Wax (Thousands of Pounds)	96,910	116,096	+16.5
Coke (short tons)	663,000	400,000	—39.7
Asphalt (short tons)	768,000	933,000	+21.5
Road Oil	1,145,000	1,047,000	— 8.6
Miscellaneous	407,000	459,000	+12.8
Other Unfinished Oils	38,299,000	40,857,000	+ 6.7

* Stocks June 22, 1940.
† Stocks June 21, 1941.

Petroleum Exports Remain Greatly Curtailed

ITEM	APRIL 1940	APRIL 1941	APRIL Percent Change	FIRST 4 MONTHS 1940	FIRST 4 MONTHS 1941	FIRST 4 MONTHS Percent Change
Crude Oil	4,262,000	2,503,000	— 41.3	15,837,000	7,520,000	— 52.5
Products:						
Motor Fuel	2,075,000	[1]2,288,000	+ 10.3	8,517,000	7,742,000	— 9.1
Aviation Gasoline	410,000	[2]63,000	— 84.6	1,203,000	1,355,000	+ 12.6
Kerosene	399,000	180,000	— 54.9	1,573,000	519,000	— 67.0
Gas Oil & Distillate	1,966,000	[3]956,000	— 51.4	7,067,000	4,379,000	— 38.0
Residual Fuel Oil	1,532,000	1,378,000	— 10.1	4,372,000	4,561,000	+ 4.3
Lubricants	1,161,000	775,000	— 33.2	4,511,000	2,756,000	— 38.9
Wax (thousands of pounds)	19,156	[4]11,933	— 37.7	94,207	49,878	— 47.1
Coke (short tons)	27,500	17,000	— 38.2	63,300	53,800	— 15.0
Asphalt (short tons)	29,400	23,300	— 20.7	91,700	77,800	— 15.2
Miscellaneous Oils	85,000	68,000	— 20.0	462,000	205,000	— 55.6
[6]Total Refined Products	7,585,000	[5]5,900,000	— 22.2	27,659,000	21,035,000	— 23.9
Total Crude and Products	11,847,000	8,403,000	— 29.1	43,496,000	28,555,000	— 34.4

[1] Includes 11,000 barrels benzol and 760,000 barrels exported from bond.
[2] Includes 5000 barrels anti-knock compounds.
[3] Includes 80,000 barrels exported from bond.
[4] Includes 154,000 pounds exported from bond.
[5] Beginning April, 1941, data concerning shipments to and from noncontiguous territories not available.
[6] Not the sum of the above figures, some of which do not indicate barrels.

Dual Gathering and Input Lines Mark Big Cooperative

Cotton Valley Cycling System

By ELTON STERRETT, Staff Writer

DEDICATED July 10 as an outstanding monument to conservation, the Cotton Valley Operators Committee's more than $2,250,000 cycling plant in the Cotton Valley field is now equipped to handle 150 million cubic feet of distillate-laden gas per day, to extract 11,000 barrels of hydrocarbon fluids, and to return in the neighborhood of 140 million cubic feet of stripped gas and propane to the two producing sands.

The agreement, under which all sands lying below the base of the Travis Peak formation in the Cotton Valley field are unitized and to be exploited by a committee from former individual producers in that area, is sponsored by state conservation authorities and legalized by their action in declaring the return of lean gas to the sands a conservation necessity.

On this basis an operators' committee, representing either individually or by proxy every producer from the "D" and Bodcaw sands, planned the plant, the two gathering systems and the straight-line top-of-structure input system, and worked out an equitable distribution of revenue whereby all operators would be compensated for wells already drilled, whether or not these were to be continued active either as gas sources or as input wells.

In the furtherance of the plan some slight shifts in wells were made, such as plugging back Bodcaw producers to the "D" sand either as additional sources from that sand, or to be used in repressuring it.

Estimates of gas-cycle time through Bodcaw and "D" sands range from 70 to 77 months up to

as long as 10 years, with the potential distillate production offering up to the latter limit as potential operating time on the sands now being worked. Below the Bodcaw, and approximating it in thickness, permeability and probable productiveness, lies the Davis sand, already tested but at present sealed off to avoid offset drilling, as well as three other sands of the same series that are potential distillate sources. The plant is therefore provided with profitable operation on present sands until well after amortization of all costs is completed, with lower sands to provide continued and even more profitable exploitation of their production to make the project one of enduring value.

In listing the advantages to be derived from the accomplishment of unitization and cycling in the Cotton Valley field, the Louisiana Department of Conservation set up the following benefits:

The project will return to the State of Louisiana in taxes over $2,000,000 at the current rate of taxation from Bodcaw and "D" sands alone.

It will increase ultimate distillate recovery by 50 percent by halting retrograde condensation in the formation with accompanying increase of surface tension in the sands and resistance to all pressures.

It will more than double the life of the field as under former operating conditions.

It will retard encroachment of edge and bottom water.

It will prevent waste of gas in recovering distillate.

It will eliminate drilling of unnecessary wells under offset requirements, effecting a saving estimated at $10,500,000.

It will make possible economic recovery of gasoline and other hydrocarbon content from gas from Bodcaw and "D" sand wells being blown to air under individual production.

It will permit the recovery of stock tank vapor loss at distillate wells, this loss being checked at from 15 to 20 percent of fluids produced under individual operation with usual lease tank system.

It will prevent the selling of dry gas at distress prices.

It will assist in maintaining a balanced oil and gas reserve within the sands at low relative cost.

Gathering Systems

Due to the symmetrical shape of the producing zones both in the "D" and Bodcaw sands, the 2000-pound or high-pressure loop for recovery of distillate-bearing gas follows an octagonal plan, closely approximating a contour well down the structure and requiring a minimum of stubs and branches to permit production to depletion.

Since the long axis of the field lies almost exactly northeast and southwest, the system follows closely the intercardinal points, with the four feeders from the loop lying almost along these lines.

The loop itself, of six-inch O.D. pipe, is tied in to form a complete circuit, around which gas may flow as desired through any quadrant and be led to the plant through either of the two feeders tapping it. The position of the plant, centered on the structure, requires feeders of 5908 and 5328 feet respectively in northwest and southeast directions, across the minor axis, and 8767 and 11,042 feet along the major axis, with the greater span to the northeast.

Design of the collecting loop, with branches to those wells designated on the plan as initial flow units, includes dual block gates at either side of the feeder branches, with S-bends to absorb expansion changes in line lengths at these points, the gates themselves being set on heavy concrete pedestals to prevent their shifting and overstressing of the tie-ins.

Actual construction of the loop, projected as a stovepipe welding job with no anticipated difficulties, ran into weather troubles almost from the start. Most of the line lay through wooded terrain, and ditchers and tractors, normally able to work even in soft soils, sunk rapidly and could be operated only from repeated corduroyings of the right-of-way. For much of the more difficult teaming, Latex Construction Company, Houston, contractors for all the gathering and input laying outside of the plant yard, found it necessary to resort to ox-teams and sleds to move pipe and welding units.

The radiating feeder lines, tying in to the 2000-pound loop through block gates, are of 6⅝-inch pipe, 0.375-inch thick, for a short distance inward from the loop, and then are stepped up to 8⅝-inch line with a ruling thickness of 0.487-inch to the plant yard. These lines were all welded, 6 beads with 3/16-inch high-tensile welding rod being the rule on all thicker sections.

Low Pressure Loop

Outside the high-pressure loop to the southern half of the field is laid a second or low-pressure loop, circling the outer edge of the structure and lying approximately in the middle of the crescent-shaped zone down structure which produces oil with the gas, and from which the gas only, but not the oil is taken by the plant and processed, being returned to the sands along with gas obtained from the distillate-bearing section.

This outer loop requires three mains or feeders to the plant, the eastern branch being 15,468 feet, the southern 9619, and the western 14,216 feet. On these, as with all other pipe lengths, dimensions are given to nearest foot. These three mains permit flow from any portion of the field through this low-pressure system, block gates permitting isolation of any section without impairing use of others.

Extension of this low-pressure system to enclose more or all the northern half of the field is provided in the plans, in case further development indicates that the eight-mile strip carrying oil covers more than the section now drilled and producing.

Input System

The plan being to return gas to the structure at the apex, the twin input mains closely parallel the northeast and southwest mains of the high-pressure loop. To handle the high pressures required in the input system, two 6⅝-inch O.D. mains, with 0.597-inch walls, were laid instead of one larger line. The dual system also provides greater flexibility in handling the input gas distribution as development of the field indicates shifts to be desirable.

The parallel lines to the northeast are 3898 and 4894 feet in length, the other pair being 3492 and 3676 feet respectively. Each main is equipped with preformed expansion loops of the usual omega shape, the lines being brought above-ground and the loops anchored at the center of the sweep with chafing plates welded on to take the wear at the quadrantal bearing straps. Movement as great as 12 inches has been observed at some of these points, as the line adjusts itself to extremes of pressures and temperatures. The lines are designed to operate under in-

[*Continued on page 76*]

Largest of 10 BRADEN Buildings in Cotton Valley Recycling Project, Cotton Valley, La. Houses 7,200 H.P. battery of compressors.

WORLD'S LARGEST RECYCLING PLANT HOUSED IN BRADEN BUILDINGS

The Cotton Valley Operators' Committee recycling plant, at Cotton Valley, Louisiana, is greater than any previous plant of its kind, incorporating an entire field in its pressure maintenance program. It is designed to pass 150,000,000 cubic feet of gas daily. A total of 7,200 H.P. is installed to compress gas for injection. (See BRADEN Building above, which houses battery of compressors.) In its volume of output, it dwarfs all other plants, for the high yield of condensate from Cotton Valley gas will facilitate an estimated daily production of 10,000 barrels of stabilized condensate and about 2,500 barrels of butanes.

BRADEN Buildings, 10 in all, were selected by the Cotton Valley Operators' Committee to house this world's largest recycling plant. BRADEN Buildings are always the choice when operators want the following features:

- Durability
- Speed of Erection
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Gulf Coast Representative: R. W. (Bob) Rogers, 229 Shell Bldg., Houston, Texas.
Telephone Preston 5141

Application of the most advanced recycling methods will result in a 40% increased recoverable condensate—recovery of butanes—improved gas conservation—and added oil recovery from the field's rim, accruing greater returns at a shorter pay-out to operators and royalty owners alike.

BRADEN

COTTON VALLEY

Producing System

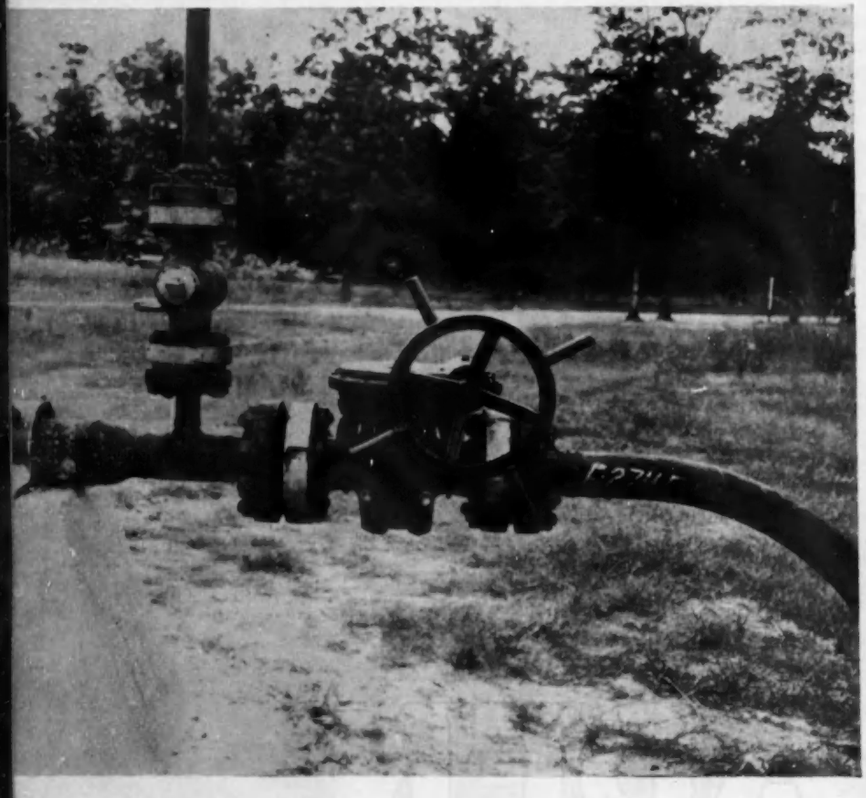
Christmas tree and control manifold (left) on well near the axis of the structure. Both casing and tubing flow lines are preformed to wide expansion sweeps and anchored to heavy concrete piers. Checks protect both lines against back pressure.

Worm and hand-wheel operated plug valve (left below) carried close to supporting pier to minimize vibratory effect, serves to isolate well from gathering system, a wide preformed "S" sweep tying in the outlet with the manifold to absorb temperature and pressure changes. On a riser between well and control valve a lubricated plug valve, manually operated, permits venting well to atmosphere through a short stack, also serving to vent line when first put on stream.

On the tie-in to a branch of the Christmas tree, (below) a close vertical reverse bend is employed for expansion relief, with anchored brace to suppress vibration and lateral sway.

Eventually all wells under unitized operations will be equipped with extension stems on the main valves so as to permit control from a point outside the danger zone in case of blowout or fire. This well is equipped with long sweep tie-in, and with formed S-bend to connection with casing within the cellar.

On the 2000-pound, high-pressure inner loop of the gathering system (left above), each section is protected against overloading by dual relief valves and lines. A manually operated plug valve, carried on formed bends over the line,



opens to a vertical vent. Flanking the manually operated valve is a spring-loaded relief, with emergency valve below, this latter also tied in to a separate vent line.

Each branch in the gathering loop is equipped with worm-geared, manually operated valves, (right above) permitting isolation of any section of the line in case of break, and providing maintenance of flow to the plant through other members of the collecting network. Each valve is mounted close to heavy concrete anchor block, with a preformed sweeping S-bend to tie in to the main and take up the great variations in line length due to pressure and temperature changes.

COTTON VALLEY

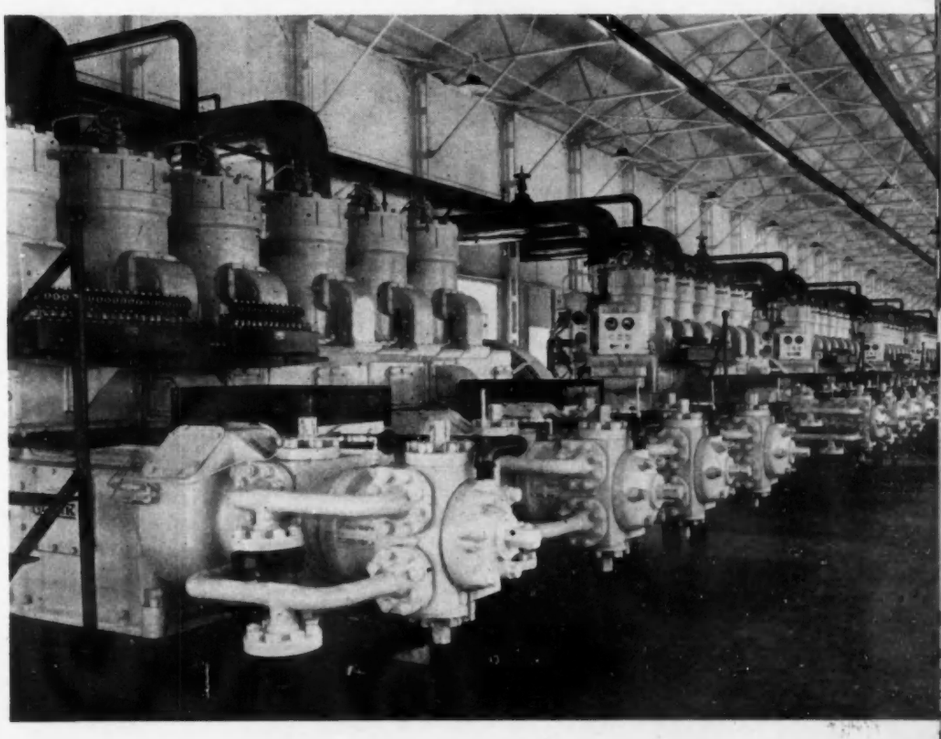
Input System

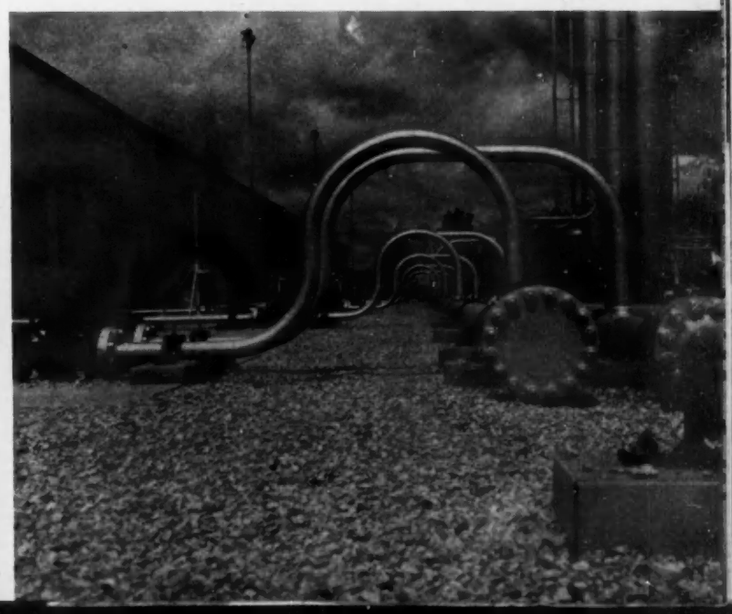
Twelve 600-horsepower, 12-cylinder angle compressors pick up stripped gas and compress to 3000 pounds per square inch for reinjection into "D" or Bodcaw sand under present production schedule, or for return to Davis and other deeper sands when depletion of present sources leads to exploitation of reserves already discovered but shut off to prevent offset drilling under unitization program.

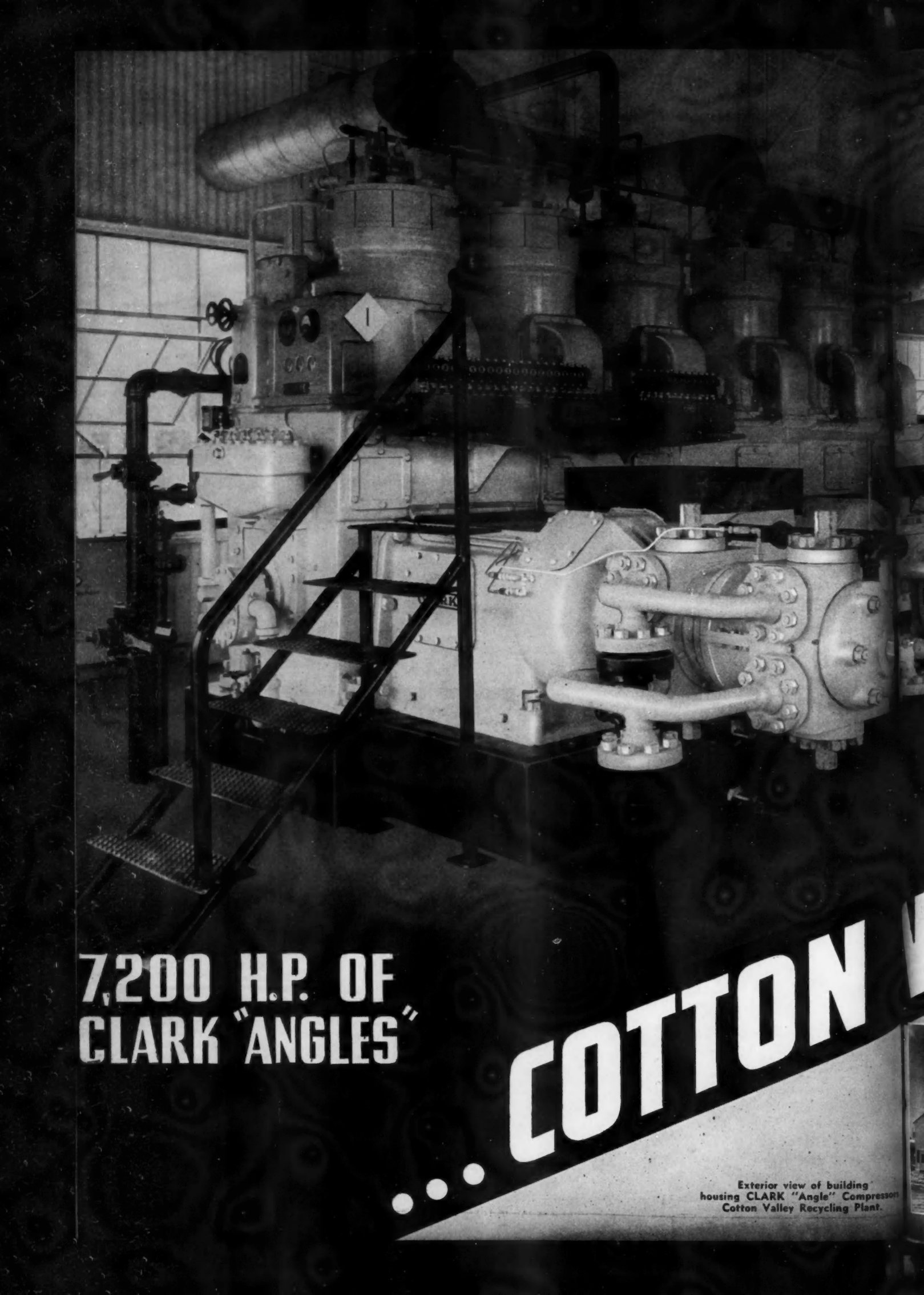
Intake and discharge manifolds for each unit are carried in pits beside units, as shown in construction view at left below. Full formed saddle welding outlets permit distribution of pressures over wide areas at junctions of risers with mains, while adjustable spacer arms, terminating in plates carrying hardened set-screws, permit fixing of lines to suppress vibration and yet allow lateral shifts under temperature or pressure changes.

Tie-ins to the parallel intake and discharge headers are risers, right below, with "P" bends to anchorage adjacent

[*Continued on page 68*]





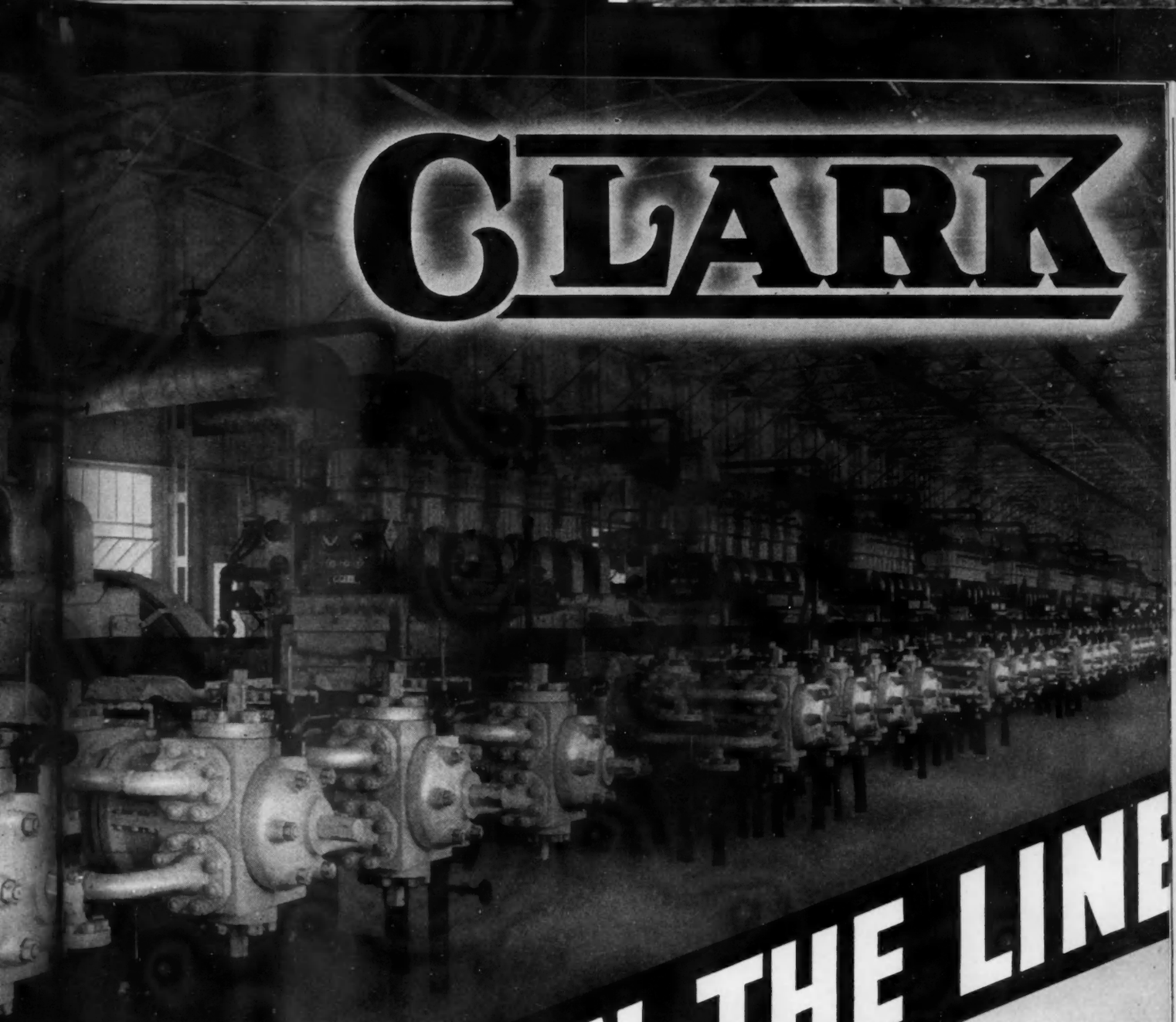


7,200 H.P. OF CLARK "ANGLES"

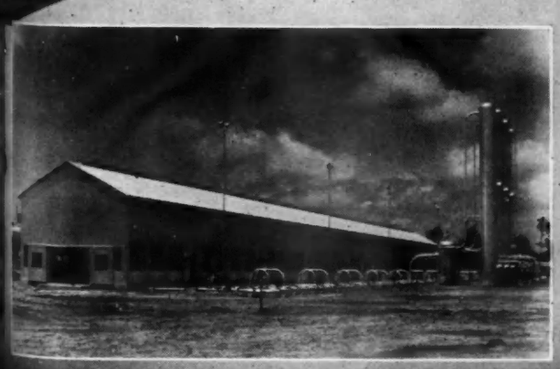
... COTTON

Exterior view of building
housing CLARK "Angle" Compressors
Cotton Valley Recycling Plant.

CLARK



VALLEY-ON THE LINE



The Cotton Valley Recycling Plant, just completed at Cotton Valley, Louisiana, provides an outstanding example of effective cooperative effort in gas conservation. The Cotton Valley Field is a major reserve of the gas condensate type, the reservoir having been originally estimated at 526 billion cubic feet of high-pressure gas containing 47,000,000 barrels of condensable carbons. The new recycling plant serves the project confined to sands below top of Cotton Valley formation, having been constructed by a cooperating group of 30 operators and 600 royalty owners.

The plant is designed to handle 150,000,000 cu. ft. of gas daily. Gas is taken from 69 condensate wells, reaches the inlet gas scrubbers at pressures averaging 1,500 lbs., and is returned to the sand through ten injection wells at a pressure of 3,200 lbs. The plant can produce daily 13,300 bbls. of natural gasolines, 2,500 bbls. of butanes, 2,400 bbls. of kerosene, and 650 bbls. of isopentane. High-pressure absorption is used to extract the liquid fractions of the gas, and the most advanced recycling practices are employed.

The compressor battery consists of twelve 600 H. P. CLARK "Angles." Ten of these compress the gas and return it to the sand at 3,200 lbs. pressure. These units are equipped with forged steel compressor cylinders and are arranged so the plant can obtain maximum flexibility under a wide range of conditions. The other two compressors operate on recompressor vapors at pressures from 350 to 1,500 lbs. and are equipped with cast steel compressor cylinders.

The Cotton Valley project represents an important new chapter in the conservation of natural reserves and is thus a basic contribution to the program of national defense. Clark wishes to compliment the Cotton Valley operators and royalty holders on this splendid cooperative achievement.

CLARK engineers are experienced in every phase of oil industry engineering having to do with recycling and pressure maintenance. Their expert knowledge and advice are yours for the asking. Get in touch with our nearest office.

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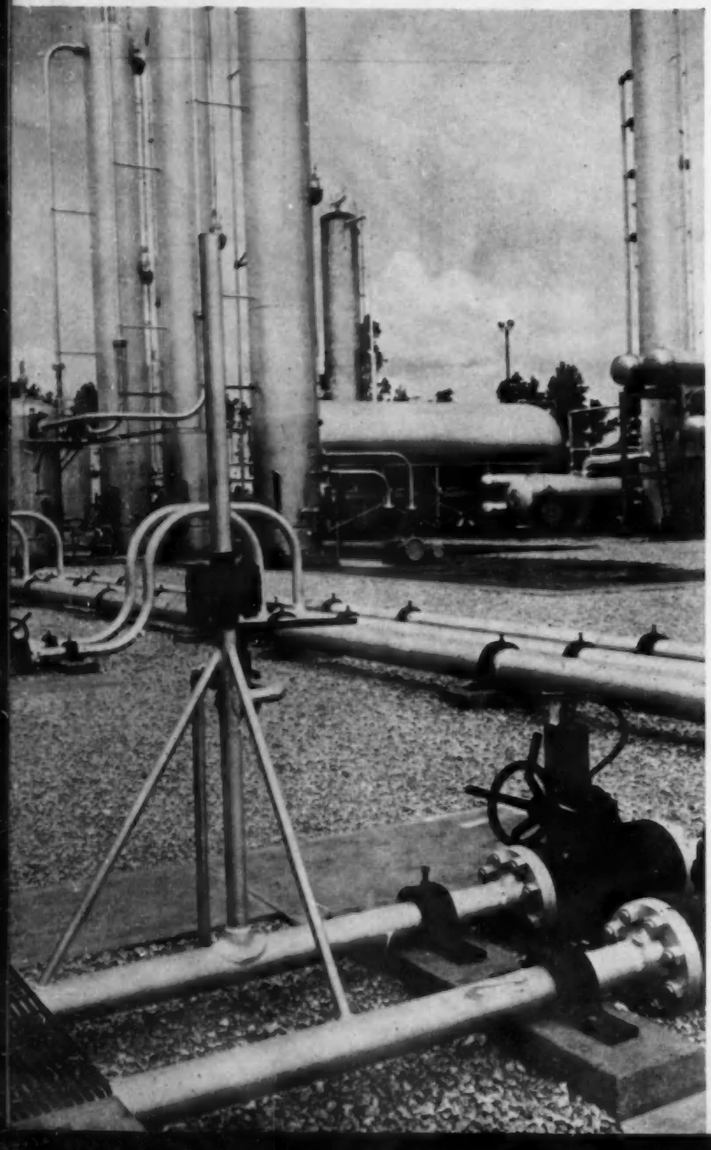
COTTON VALLEY—(Continued)

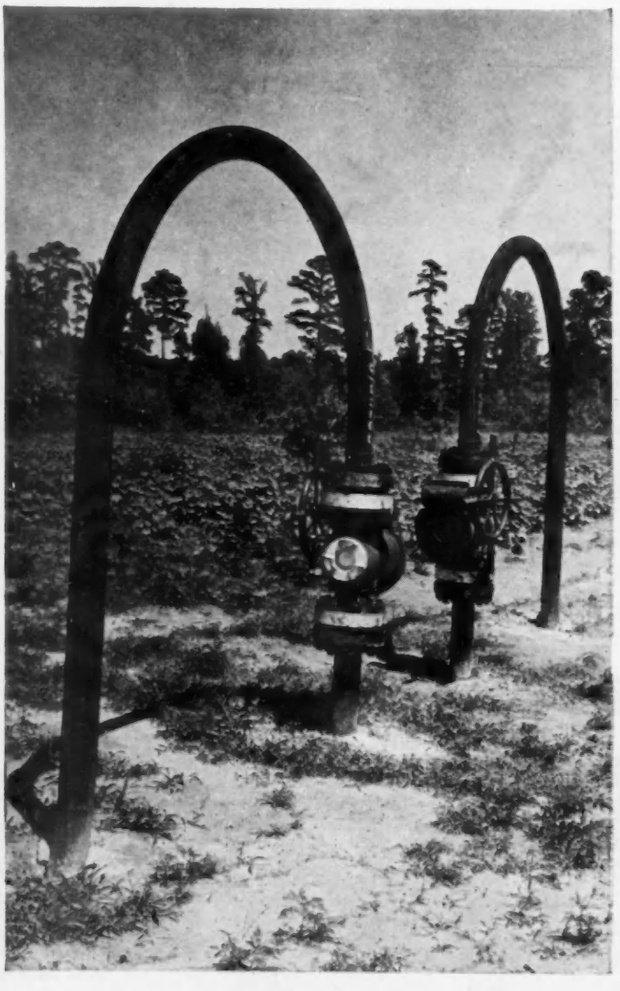
to manually operated plug valves on each lead. Bends are prefabricated, and field welded to flanges and to forged saddles on mains.

Each unit discharge line to the outside gathering main for the high-pressure input gas carries overload insurance in the form of a rupture disc and flanges, vented to atmosphere and supported by braces to absorb side thrust and whipping in case of pressure release (left below).

Side loops, (left) brought above ground from the buried input lines, permit absorption of length variations due to temperature and pressure changes. The 3200-pound input system is built in parallel, with alternate wells so tied in that repressuring may be regulated through either or both lines. Except for the anchorage at the throw of the loop, each section of the high-pressure line is free to shift within its ditch and up to the limit of the guides on the bearing blocks at the loop stations. The thick-walled pipe carries chafing plates at points of contact with guide straps to prevent possible reduction of area through abrading wear.

Risers from the twin input mains, right below, are tied in to the repressuring wells through "P" bends carrying vertically mounted plug valves which permit isolation of the branch leading to each input well—where additional protection is afforded by the usual Christmas tree and check valves.





COTTON VALLEY

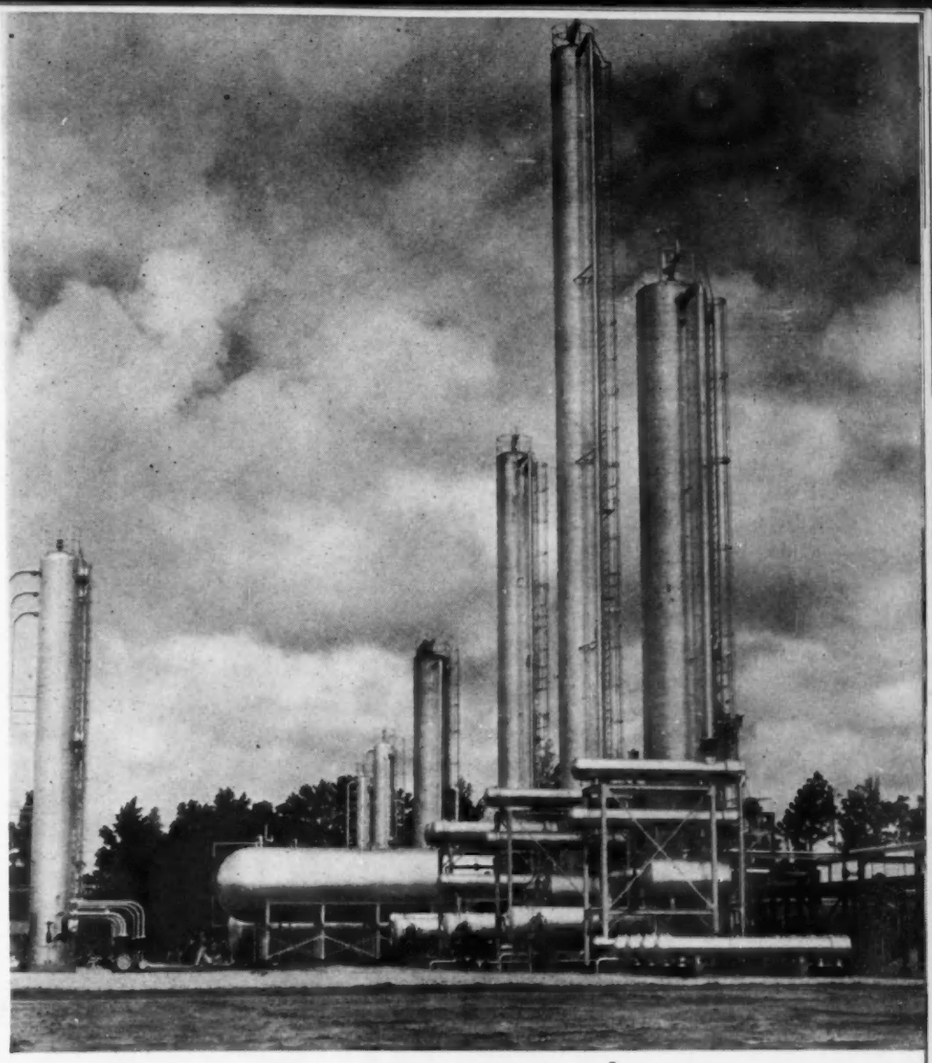
Liquid Recovery

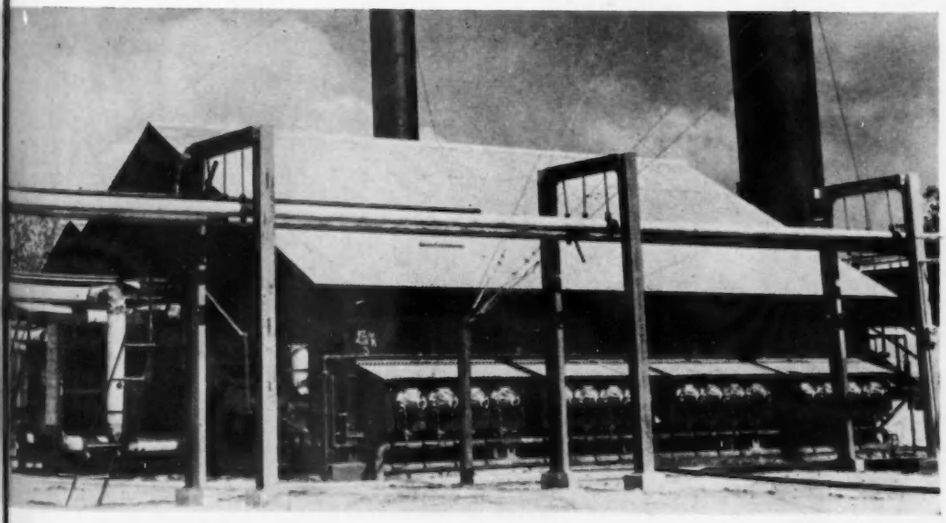
Daily, 150 million feet of gas enters the plant (right) at pressure of 2000 pounds, being reduced to 1500 pounds before entering first scrubber, center. From the scrubber the gas passes to a battery of three high-pressure absorbers, in which lean oil enters at the top, counterflow discharging the stripped gas at the top, through a second scrubber, whence it enters the intake mains to the compressors. Horizontal heat exchangers in foreground permit regulation of process temperatures.

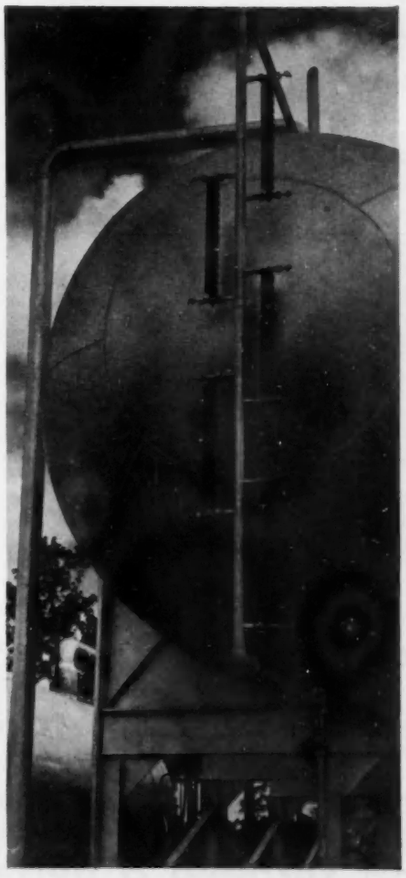
Direct-fired furnace, (below) permits distillation of heavier fractions from tower, together with removal of entrained water in output. Overhead bents, with flexible supports, carry all lines to and from furnace and connected equipment.

Staggered reflection-type high-pressure gauge glasses (below, right) provide accurate check on fluid levels and quantities being handled during processing. Top and bottom tie-in of gauge loop provides full hydrostatic head against fluid in gauges to suppress fluctuations and provide steady and accurate reading from ground level.

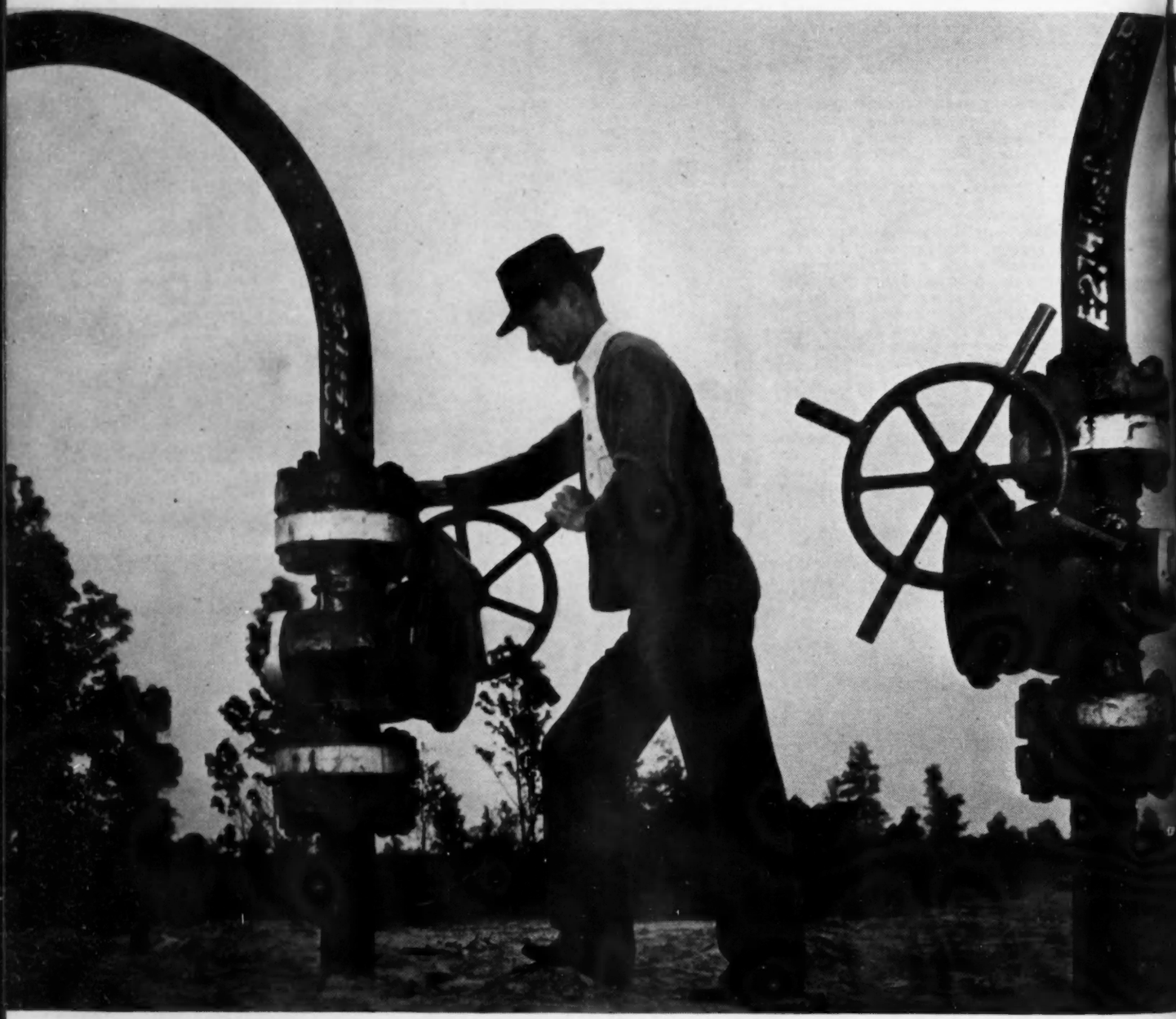
Battery of ten 40-foot and 16-foot horizontal "blimps" (bottom, left) afford storage of butane recovered from distillate, the tanks being individually mounted on curved pedestals on concrete bases, with provision for expansion away from end at which all connections are made and gauge fittings carried. [Continued]







Cotton Valley Operators Selected



The Mission Plug Valve maintains a constant perfect seal by using the line pressure to automatically force grease from reservoirs to grease grooves. These grease grooves completely encircle each port forming a perfect seal which prevents gas leakage. A plug so completely and continuously lubricated always turns easily.

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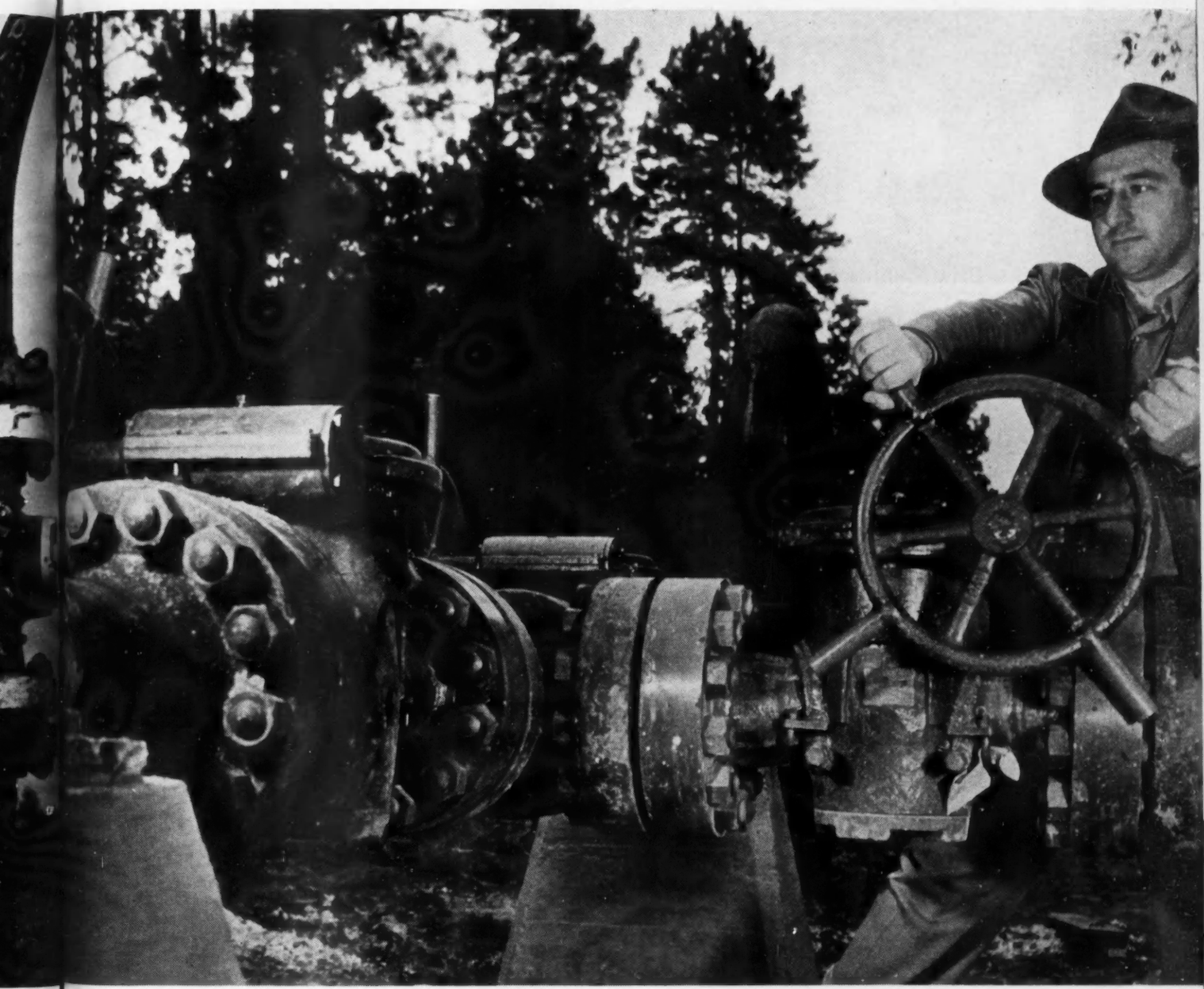

* When lubricating a Mission Plug Valve, a portion of the lubricant is forced into reservoirs. Thereafter, line pressure *AUTOMATICALLY* feeds this stored lubricant, as needed, into the downstream seal grooves. So long as lubricant remains in the reservoir a perfect seal is assured.

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COTTON VALLEY

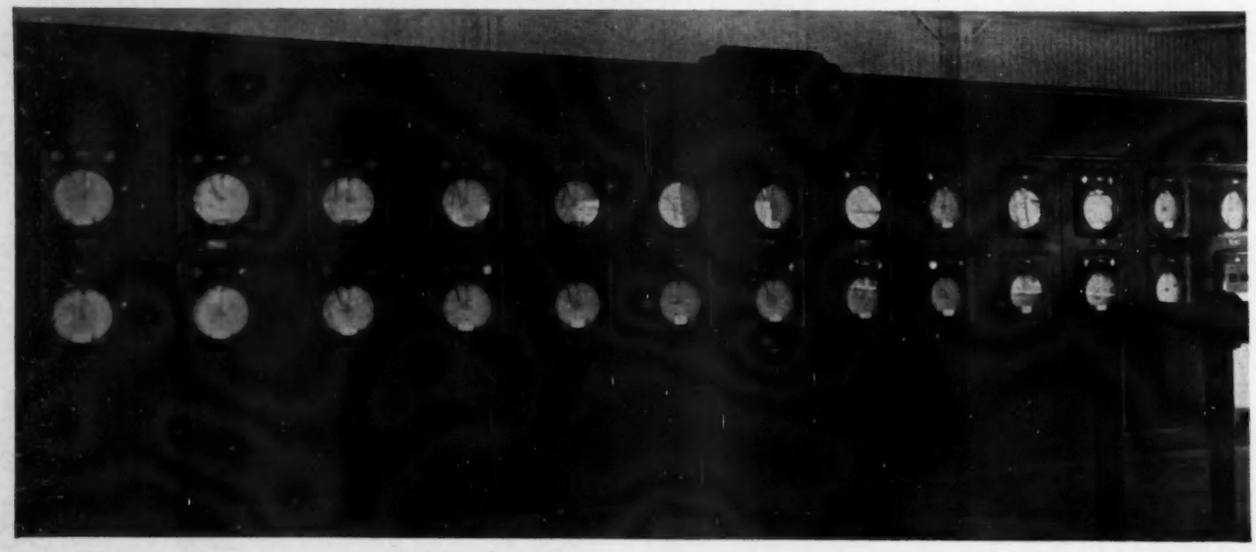
Transfer Equipment

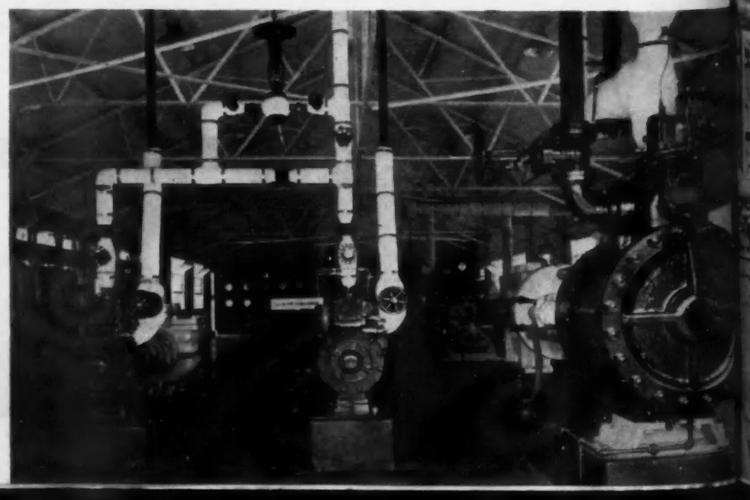
Transfer pump room is typical of steel frame, corrugated roof and siding structure housing units of Cotton Valley plant. Centrifugal pumps (right) individually powered by explosion-proof motors, permit wide range of fluid handling.

Individual controls (bottom, left) for the motors powering the transfer pumps bear the same numbers on their cases as are marked on the motors, insuring correct starting and manipulation.

The only steam-driven pumps (bottom, right) in the transfer room and the two handling lean oil to the high-pressure reabsorber, dual units being provided for this service, and one pump handling propane at the end of the process and boosting it to 3000 pounds for return to the repressuring main for return to the formations.

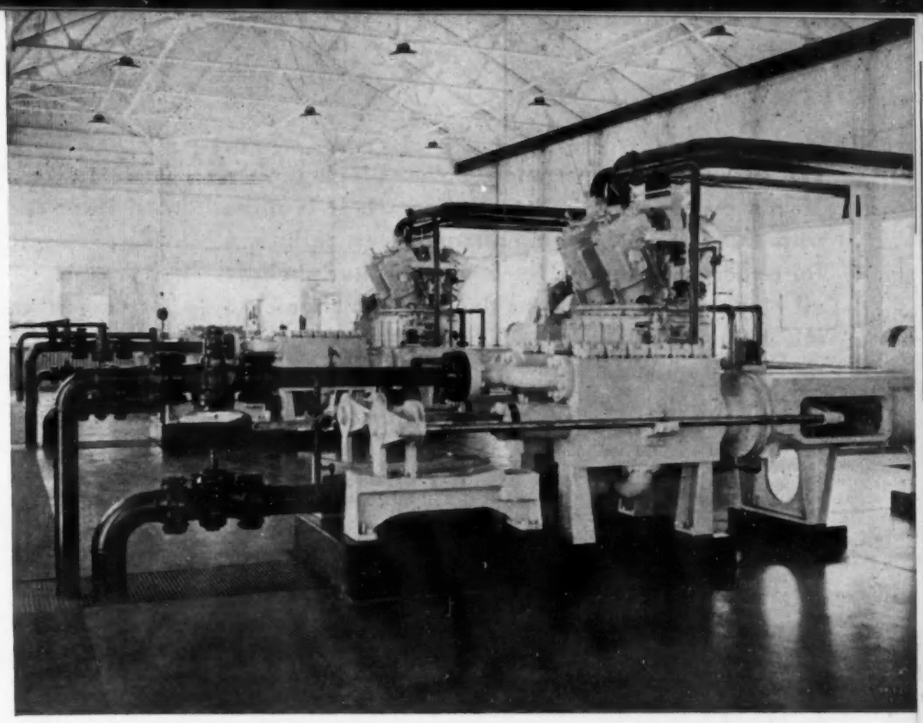
A dual panel extends across the entire end of the transfer room, providing recorded indications of all pressures, temperatures and quantities handled by the plant.





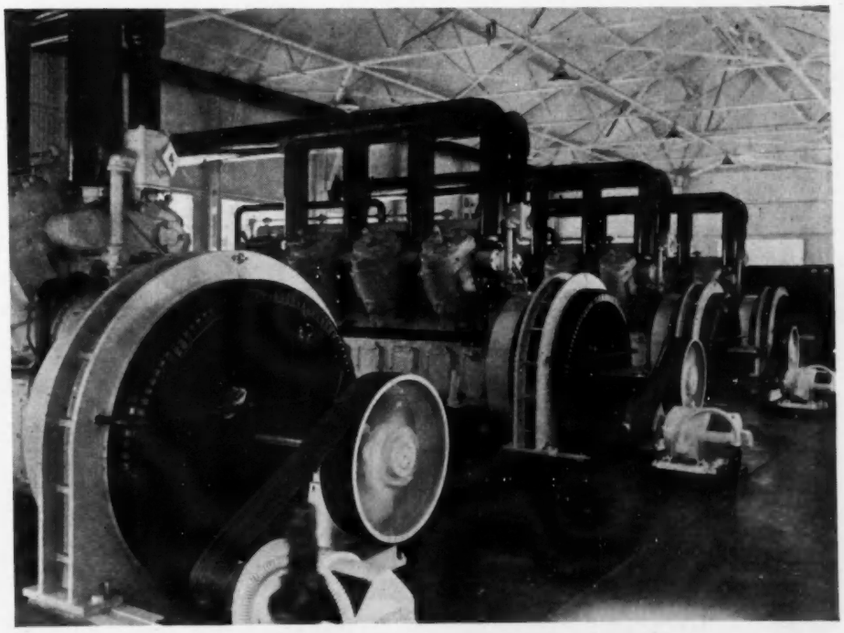
COTTON VALLEY

Auxiliary Power Plant



Three duplex pumps (top), with forged blocks and drilled passages, handle high-pressure lean oil in the absorber circuit, with quarter-turn valves on inlet and discharge lines for fluid control. Slide for outboard bearing on pump plungers is provided with dual sump for segregating lean oil drippings through packing gland to prevent cutting of lubricant on slides.

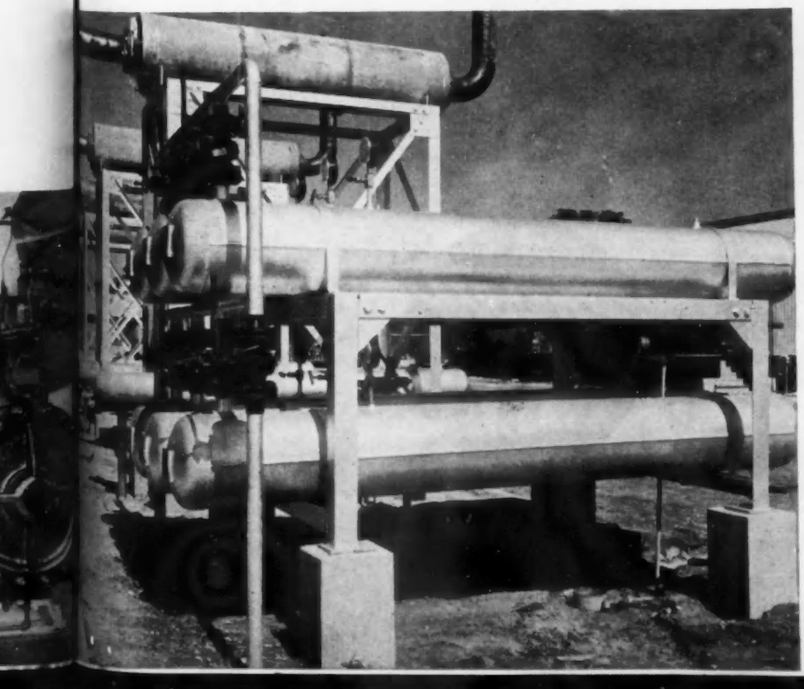
Four 370-horsepower, (right) 8-cylinder, four-cycle gas engines, direct-connected to D.C. generators, provide all current for power and lighting needs of plant. Generators are individually excited through Vee-belt driven exciters, shown in the view with belt guards removed for painting. All exhaust lines are jacketed and insulated to minimize heating effect within engine room.

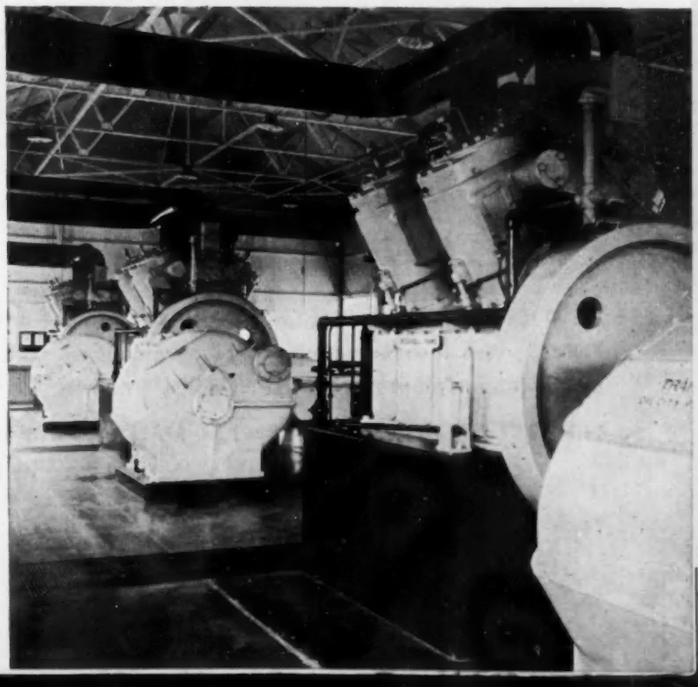


Reserve storage (below, left) of fuel gas for the electrical generating equipment is provided by a bank of six high-pressure horizontal tanks, 16x120 inches, carrying fuel gas under main pressure of 350 pounds, and floating on the line under normal conditions to serve as absorber for fluctuations in pressure. Each tank is provided with drip and control valve, and all may be charged and placed on fuel intake in case of stoppage of normal gas flow through plant, thus providing power and light during shut-down periods.

Three 187-horsepower (below, right) four-cylinder, four-cycle gas engines, connected through flexible couplings to the reduction gears of the individual pump units, power the three 3¾x18-inch duplex plunger pumps handling lean oil to the absorbers under pressures in excess of 1500 pounds per square inch.

[Continued]





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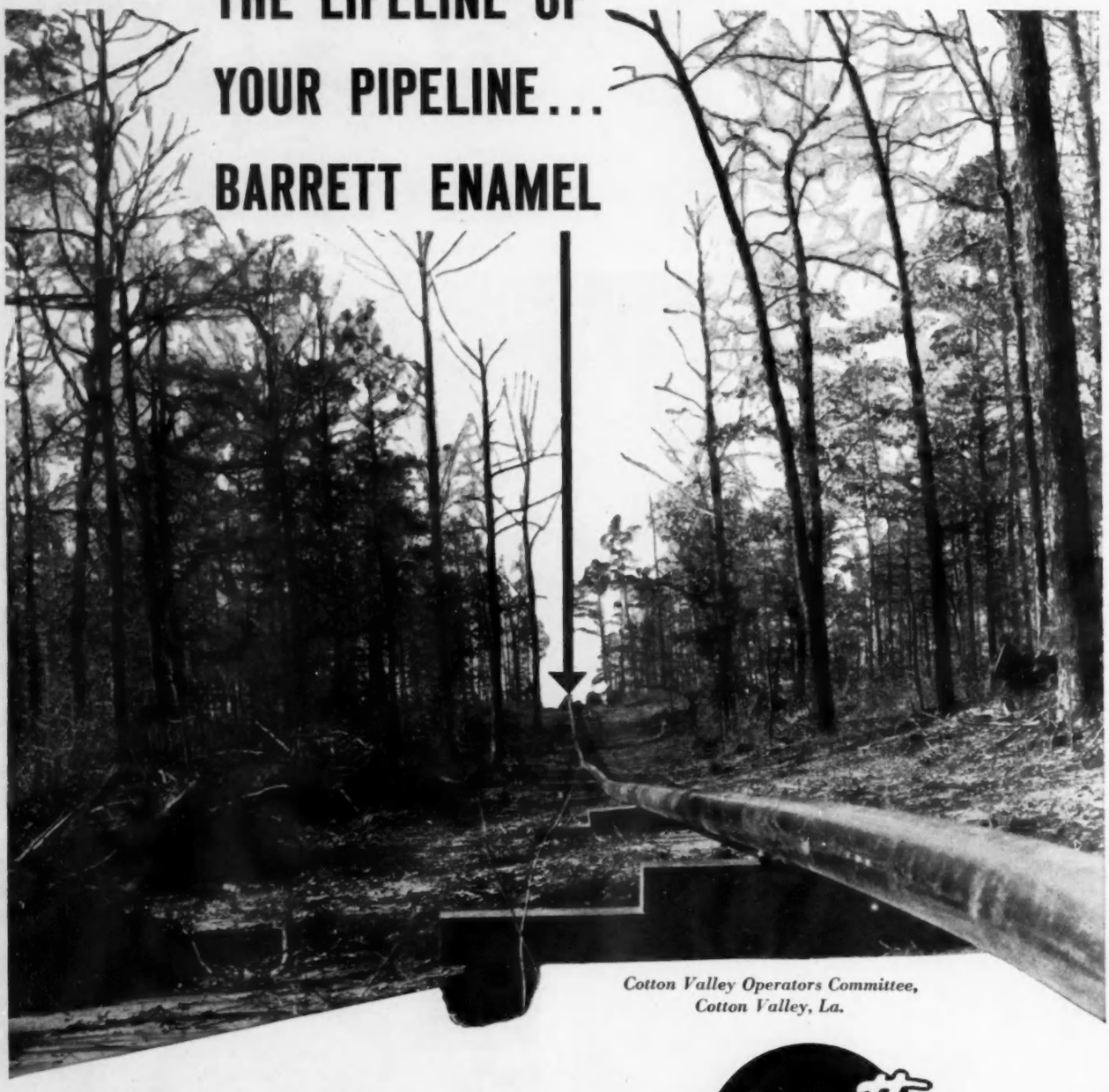

Cotton Valley Operators Committee, Cotton Valley, La.

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[*Continued from page 62*]

put pressures up to 3200 pounds per square inch.

The branches or stubs to the input wells are carried on risers welded into the tops of the distribution mains, with reinforcement through forged welding saddles. The riser carries a quarter-turn plug valve, manually operated through worm-gear drive, and thence through a P-bend ties in to the branch to the well, where the usual fittings permit further control of input distribution.

Shifting of the lines through pressure or temperature changes is fully absorbed at the fixed points or anchorages at expansion joints and well fittings, with the soft and usually wet soil of the district being relied upon to permit necessary travel between anchorages.

Since all processing of the distillate-laden incoming gas is carried out at pressures beginning at the 1500-pound ruling value established by plant design, the stripped gas is cleared through the final scrubber at a temperature which enables the 600 - horsepower, 12 - cylinder compressors to operate under a single stage in boosting the pressure to above 3000 pounds for return to the formations.

The compressors are arranged in a single row, with mufflers and exhaust systems on the side of the building away from processing equipment and gas lines. All leads are brought into the building through floor pits, normally covered with steel plates, but large enough to permit work on any unit as necessary. Each compression unit is served through a single pit, closed at the end adjacent to the next unit, and curving through 90 degrees to permit the incoming and discharge lines to pass through the chain wall.

Both lines are carried on adjustable legs of pipe, welded to the mains and terminating in square plates, through the corners of which are hardened set screws. The rounded ends of these set screws bear against chafing plates set into the concrete bottom and sides of the pit, and permit the pipes to be adjusted vertically and laterally to remove strain on manifold fittings and to suppress any vibration which might be set up in free-swinging sections under operating conditions. The adjustable line supports permit easy dropping of the tie-in flanges for servicing the joints in case of leakage.

Each discharge line outside the plant is protected by a rupture disc, carried on short stub welded to the line and terminated in a short stack. These vertical risers are braced both to the discharge line and to the adjacent incoming line to minimize vibration. A manually operated by-pass valve is tied into the riser just below the rupture disc flanges.

Current requirements for operating the plant, in which all pumps except those handling lean oil and one returning propane to the 3200-pound input system are motor driven, are covered by 4 D.C. generators direct-connected to 4 eight-cylinder, 370-horsepower four-cycle gas engines, running at 400 rpm. These generators are separately excited through vee-belt driven exciters, normally turning at 1750 rpm.

Distribution of current to the transfer room, water circulating pump house and other points around the plant is through buried conductors, carried in conduits, and terminating in explosion-proof junction boxes and control panels. Throughout the plant, all wiring is enclosed, distribution for lighting circuits being accomplished through enclosed panels, all provided with outdoor emergency switches providing for isolating any section of the electrical system.

Outdoor switches, placed near the corners of the building, also permit the shutting down of the compressor units from a safe point, in case of trouble within the building.

The 3 twin-duplex plunger pumps, 3¾ x 18 inches, handling lean oil to the absorbers under minimum pressures of 1500 pounds p.s.i., are individually driven by 4-cylinder, 4-cycle gas engines, delivering 171 horsepower at 387 rpm. Six-inch suction and 4-inch discharge lines, controlled by quarter-turn valves, serve each pump, with a 1-inch by-pass tying the manifolds together. The cylinders on the lean-oil engines are 11 x 13½ inches, as are those of the electric-generating drives, reducing the number of spare parts required for maintenance needs.

Two lean oil to high-pressure reabsorber pumps and another which handles propane back into the input system at 3000 pounds pressure are reciprocating and steam-driven, all others in the process handling fluids throughout the plant being centrifugals, motor-driven and with individual remote controls. Since the operating personnel of the plant is largely drawn from men formerly working leases in the field as switchers and pumpers, each unit in the transfer room carries identification in the form of a large sign, on which is lettered the name of the fluid handled and its destination. This is believed to speed up changes within the flow system, and to guard against possible errors in operation.

Hudson Engineering Corporation, Houston, was general contractor on the plant, with Cotton Valley Operators Committee represented by J. R. Butler, general manager; R. E. Perry, plant superintendent; and M. L. Mayfield, chief petroleum engineer.

We extend Congratulations to OPERATORS and PERSONNEL responsible for construction of the modern Recycling Plant of Cotton Valley Operators Committee . . .

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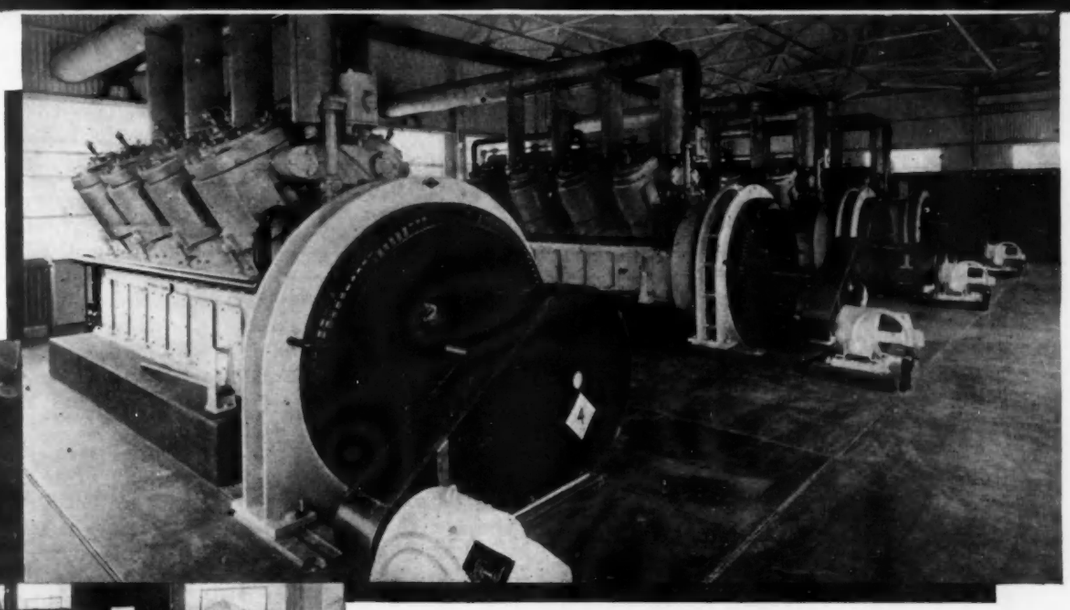
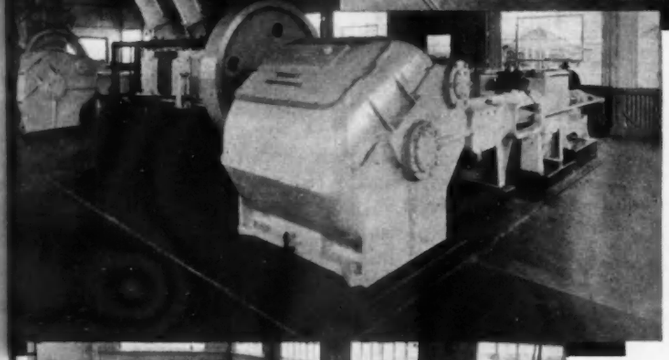
GAS ENGINES and PUMPS
AT COTTON VALLEY CYCLING PLANT





IN the new Cotton Valley Cycling Plant in Webster Parish, Louisiana, a number of Ingersoll-Rand products are performing important functions.

Four 370 H.P. Type PVG four-cycle gas engines are driving the main electric generators. Three 185 H.P. Type PVG's are driving the lean oil reciprocating pumps.

I-R Cameron single and multi-stage pumps are handling jacket, raw and sump water—fat oil—heating oil—still and gasoline reflux—depropanizer feed and reflux.

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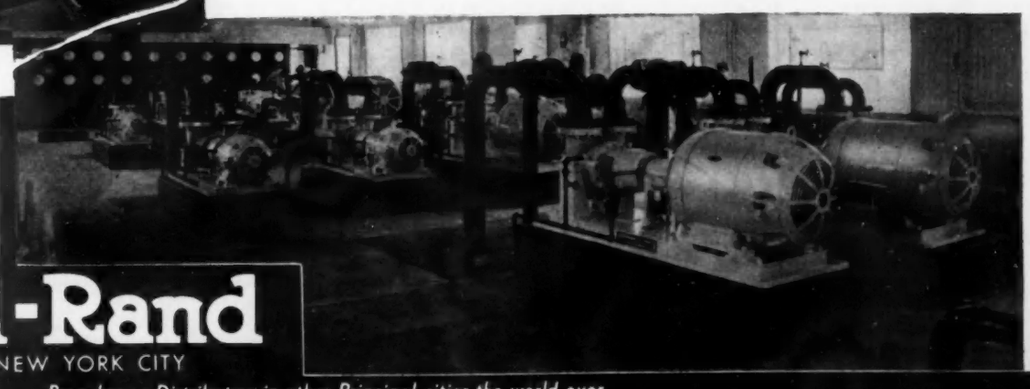

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Chicago	Knoxville	Scranton
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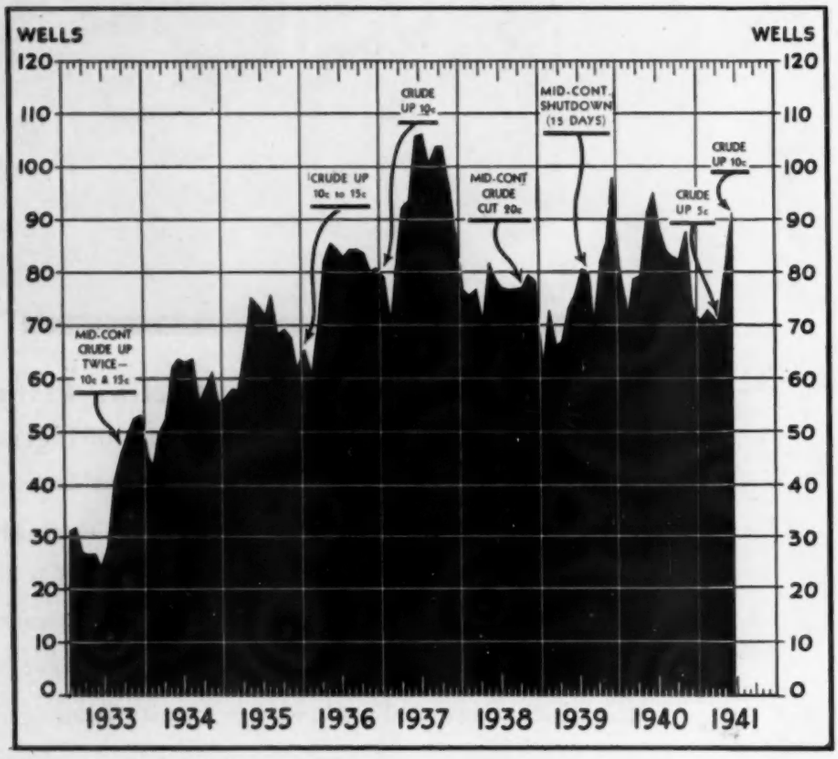
Half-Year's Well Completions Above Expectations

Average Daily Well Completions in U. S., by Months
(Latest monthly data subject to slight revision)



SO FAR, the war and the defense program have had no extraordinary effect upon drilling of oil and gas wells in the United States, and for the first half of 1941, ordinary economic factors constituted the controlling influence on field work, relatively favorable conditions having induced comparatively active development.

As in other similar periods of the past, the improving oil markets of the first half of this year stimulated drilling exceptionally, although appreciable betterment of the prices of refined products and crude oil did not get under way until the beginning of the second quarter.

Consequently, completions so far this year actually have exceeded general expectations. The 14,425 wells completed in the United States in the first six months were only 3.9 percent under the 15,007 completions in the corresponding period last year.

At the beginning of this year, this publication conducted its annual survey on drilling prospects and found that plans of numerous oil companies indicated for the country a decrease of 4.6 to 6.4 percent in completions of 1941 as

Miscellaneous Well Completions in the United States in 1941

This table gives detailed information on "miscellaneous" wells included in accompanying main table of all completions.

STATE OR DISTRICT	MONTH OF JUNE									FIRST SIX MONTHS OF 1941								
	Total Miscellaneous	Old Wells Deepened					Water Input	Gas Input	Salt Water Disposal	Total Miscellaneous	Old Wells Deepened					Water Input	Gas Input	Salt Water Disposal
		Total	Oil	Gas	Dry	Initial Production					Total	Oil	Gas	Dry	Initial Production			
Colorado	....	..	..	..	..	.....	....	....	....	1	1	..	..	1	.....	....	....	....
Illinois	48	40	36	..	4	2,932	....	7	1	133	119	108	..	11	12,503	....	8	6
Indiana	1	1	..	..	1	.....	....	....	....	15	12	9	..	3	792	....	1	2
Kansas	10	9	8	..	1	8,398	....	....	1	61	51	44	..	7	48,335	....	....	10
Kentucky	2	..	..	..	..	.....	1	1	....	7	5	4	..	1	113	1	1	....
Louisiana	....	..	..	..	..	.....	....	....	....	3	3	..	..	3	.....	....	....	....
North Louisiana	....	..	..	..	..	.....	....	....	....	2	2	..	..	2	.....	....	....	....
South Louisiana	....	..	..	..	..	.....	....	....	....	1	1	..	..	1	.....	....	....	....
Nebraska	....	..	..	..	..	.....	....	....	....	1	1	..	..	1	.....	....	....	....
New Mexico	1	1	..	..	1	.....	....	....	....	2	2	1	..	1	5	....	....	....
New York: Allegany	37	..	..	..	..	.....	37	....	....	141	..	..	..	..	.....	141	....	....
Ohio	19	..	..	..	..	.....	3	16	....	78	3	..	..	3	.....	75	....	....
Oklahoma	27	27	22	2	3	2,770	....	....	....	115	106	80	6	20	11,140	....	4	5
Pennsylvania: Bradford	177	..	..	..	..	.....	177	....	....	747	..	..	..	..	.....	747	....	....
Texas	15	11	6	2	3	2,619	1	1	2	44	34	18	4	12	6,419	1	5	4
East Texas Field	1	..	..	..	..	.....	....	....	1	3	..	..	..	..	.....	....	....	3
Rest of East Texas	1	..	..	..	..	.....	....	....	1	2	1	..	..	1	.....	....	....	1
North Texas	5	3	2	..	1	174	1	1	....	18	12	5	..	7	733	1	5	....
South Texas	5	5	1	2	2	500	....	....	....	13	13	6	4	3	1,786	....	....	....
Corpus Christi	2	2	1	..	1	500	....	....	....	6	6	5	..	1	1,710	....	....	....
Laredo	2	2	..	2	..	.....	....	....	....	6	6	1	4	1	76	....	....	....
San Antonio	1	1	..	..	1	.....	....	....	....	1	1	..	..	1	.....	....	....	....
Panhandle	1	1	1	..	..	123	....	....	....	1	1	1	..	..	123	....	....	....
West Texas	2	2	2	..	..	1,822	....	....	....	7	7	6	..	1	3,777	....	....	....
West Virginia	1	1	..	..	1	.....	....	....	....	10	10	..	9	1	.....	....	....	....
Wyoming	1	1	1	..	..	40	....	....	....	8	8	7	1	..	2,298	....	....	....
Total United States	339	91	73	4	14	16,759	219	25	4	1,366	355	271	20	64	75,605	965	19	27

compared with those of 1940. It was pointed out in connection with the forecast, however, that the unusual conditions of the year might result in revisions of oil company plans and budgets and that possible greater than expected expansion of petroleum demand might make actual results lean toward the high rather than the low side of the forecast.

In reflection of the mid-May advance of crude prices and of the seasonal influence, drilling was sharply accelerated in June, and for the month completions averaged 91.3 daily, compared with only 84.8 daily in May. In June of last year, one of the most active months in the history of the industry, completions averaged 95 daily.

Continuance of active drilling in July was foreshadowed by the fact that 4598 rigs were in operation at the beginning of the month, as compared with only 4335 on June 1 of this year and 4502 on July 1 of last year, as shown in detail in an accompanying table. Areas that became more active during June included particularly West Texas, Texas Panhandle, Texas Gulf Coast, Illinois, Ohio and West Virginia.

Rigs in Operation July 1 Greater Than Year Previously

STATE OR DISTRICT	TOTAL RIGS IN OPERATION (Drilling, Rigs Up, Shut Down)				DETAILS OF JULY 1, 1941 FIELD ACTIVITY					
					Rigs in Operation			Prelim. Activity		
	Year Ago July 1, 1940	Month Ago June 1, 1941	Now July 1, 1941	Percent Change From Year Ago	Drilling	Rigs Up	Shut Down	Derricks	Locations	Total Operations
Alabama	6	8	5	— 16.7	3	....	2	1	....	6
Arizona	8	7	5	— 37.5	....	....	5	....	....	5
Arkansas	25	37	29	+ 16.0	22	1	6	1	2	32
California	299	283	284	— 5.0	193	54	37	....	105	389
Colorado	30	28	27	— 10.0	4	1	22	....	....	27
Florida	4	3	2	— 50.0	....	....	2	....	....	2
Georgia	....	3	2	....	....	....	2	....	....	2
Illinois	482	333	353	— 26.8	276	35	42	....	52	405
Indiana	88	75	68	— 22.7	48	2	18	....	15	83
Iowa	2	4	3	+ 50.0	....	....	3	....	....	3
Kansas	283	271	263	— 7.1	224	18	21	32	41	336
Kentucky	52	42	42	— 19.2	26	3	13	....	2	44
Louisiana	184	191	200	+ 8.7	168	15	17	23	108	331
North Louisiana	50	57	77	+ 54.0	55	9	13	15	2	94
South Louisiana	134	134	123	— 8.2	113	6	4	8	106	237
Michigan	184	144	154	— 16.3	92	23	39	11	23	188
Mississippi	30	29	23	— 23.3	17	2	4	3	2	28
Missouri	12	15	14	+ 16.7	1	....	13	1	....	15
Montana	51	45	59	+ 15.7	21	5	33	....	2	61
Nebraska	13	27	25	+ 92.3	13	10	2	3	3	31
New Mexico	138	117	116	— 15.9	72	10	34	....	20	136
New York	97	67	96	— 1.0	70	10	16	6	15	117
Ohio	293	280	309	+ 5.5	223	32	54	21	52	382
Oklahoma	399	356	353	+ 11.0	277	33	45	60	43	458
Oregon	....	3	3	....	1	....	2	....	....	3
Pennsylvania	415	391	392	— 5.5	282	40	70	28	68	488
South Dakota	1	....	....	....	....	....	....	....	....	....
Tennessee	....	8	8	....	4	....	4	....	....	8
Texas	1,164	1,306	1,422	+ 22.2	1,133	92	197	87	705	2,214
East Texas Field	4	23	17	+ 325.0	12	2	3	6	4	27
East Texas Border Co.'s	20	10	14	— 30.0	8	2	4	2	1	17
Rest of East Texas	37	64	64	+ 73.0	35	6	23	3	11	78
North Texas	192	199	211	+ 9.9	163	9	39	12	184	407
South Texas	272	328	343	+ 26.1	281	26	36	23	277	643
Corpus Christi Area	141	177	183	+ 30.0	158	16	9	12	104	299
Laredo Area	76	95	99	+ 30.3	82	6	11	7	108	214
San Antonio Area	55	56	61	+ 11.0	41	4	16	4	65	130
Texas Gulf Coast	132	126	142	+ 7.6	111	15	16	23	32	197
Texas Panhandle	135	108	130	— 3.7	110	13	7	3	22	155
West Texas	270	375	409	+ 51.5	348	14	47	15	154	578
West Central Texas	103	73	92	— 10.7	65	5	22	....	20	112
Utah	8	7	7	— 12.5	2	....	5	....	....	7
Washington	....	....	3	....	1	....	2	....	....	3
West Virginia	167	194	255	+ 52.7	184	26	45	17	43	315
Wyoming	67	61	74	+ 10.4	35	2	37	....	2	76
Total United States	4,502	4,335	4,598	+ 2.1	3,392	414	792	294	1,303	6,195

Completions in First Half of Year Only 4 Percent Fewer in 1941 Than in 1940

STATE OR DISTRICT	MONTHLY COMPLETIONS								CUMULATIVE COMPLETIONS—First 6 Months							
	Total			Details for June, 1941					Total			Details for 6 Months of 1941				
	[2]Year Ago (June, 1940)	[3]Month Ago (May, 1941)	[1]Latest Data (June, 1941)	New Wells Drilled for Oil and Gas			[8]Miscellaneous	Initial Oil Production	[4]1940	[5]1941	Percent Change	New Wells Drilled for Oil and Gas			[8]Miscellaneous	Initial Oil Production
				Oil	Gas	Dry						Oil	Gas	Dry		
Alabama	1	....	1	....	....	1	....	....	1	1	....	....	....	1	....	....
Arkansas	15	13	17	11	....	6	....	1,513	93	80	— 14.0	46	....	34	....	8,561
[6]California	86	73	123	109	3	11	....	66,989	545	560	+ 2.8	461	7	92	....	357,275
Colorado	....	....	2	2	....	....	....	240	3	8	+ 166.7	3	1	3	1	255
Illinois	352	223	423	288	....	87	48	70,685	1,791	1,655	— 7.6	1,138	7	377	133	250,853
Indiana	41	44	54	24	4	25	1	3,531	197	250	+ 26.9	126	20	89	15	18,293
Iowa	....	1	1	....	....	1	....	2,896	....	2	....	....	....	2	....	....
Kansas	195	186	236	154	8	64	10	218,136	892	1,046	+ 17.3	695	29	261	61	1,015,220
Kentucky	38	33	34	15	....	17	2	350	136	143	+ 5.2	54	1	81	7	2,758
Louisiana	151	102	147	91	9	47	....	19,477	804	670	— 16.7	440	35	192	3	92,167
North Louisiana	54	42	52	29	7	16	....	2,508	288	243	— 15.6	145	26	70	2	16,631
South Louisiana	97	60	95	62	2	31	....	17,069	516	427	— 17.2	295	9	122	1	75,536
Michigan	107	56	74	34	4	36	....	5,034	614	387	— 37.0	154	27	206	....	25,167
Mississippi	22	20	20	14	....	6	....	10,299	94	86	— 8.5	65	1	20	....	42,580
Missouri	7	6	6	1	1	4	....	2	42	32	— 23.8	3	6	23	....	9
Montana	16	2	32	19	10	3	....	2,964	78	98	+ 25.6	62	26	10	....	10,438
Nebraska	....	10	4	2	....	2	....	1,142	....	41	....	15	1	24	1	4,408
New Mexico	43	28	27	18	3	5	1	4,954	358	168	— 53.1	127	9	30	2	31,729
New York	61	67	110	73	....	....	37	521	503	391	— 22.3	247	2	1	141	1,612
Ohio	126	118	174	38	60	57	19	677	422	787	+ 86.5	178	331	200	78	3,685
Oklahoma	166	174	222	121	14	60	27	38,866	1,062	1,009	— 5.0	533	73	288	115	189,214
[7]Pennsylvania	348	365	394	176	28	13	177	199	1,939	1,893	— 2.4	854	166	63	810	1,120
South Dakota	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
Tennessee	3	1	1	....	....	1	....	....	15	7	— 53.4	....	....	7	....	....
Texas	837	801	1,021	751	18	237	15	406,583	5,087	4,741	— 6.8	3,461	114	1,122	44	2,070,363
East Texas Field	21	46	52	51	....	....	1	85,484	143	317	+ 121.7	308	....	6	3	623,340
East Texas Border	2	5	1	....	1	....	....	....	8	13	+ 62.5	2	8	3	....	329
Rest of East Texas	19	64	68	40	3	24	1	14,211	120	254	+ 111.7	157	18	77	2	59,886
North Texas	185	189	255	160	1	89	5	46,515	1,113	1,143	+ 2.7	713	4	408	18	221,197
South Texas	209	168	209	137	5	62	5	54,717	1,320	1,104	— 16.4	728	36	327	13	282,180
Corpus Christi	100	89	115	80	3	30	2	40,632	624	587	— 5.9	446	15	120	6	226,842
Laredo	81	58	75	43	2	28	2	11,958	569	398	— 30.1	212	19	161	6	46,998
San Antonio	28	21	19	14	....	4	1	2,127	127	119	— 6.3	70	2	46	1	8,340
Texas Gulf Coast	146	59	93	71	3	19	....	17,032	670	369	— 44.9	282	18	69	....	71,743
Texas Panhandle	55	43	61	58	2	....	1	10,785	297	276	— 7.1	253	10	12	1	53,359
West Texas	162	180	232	214	1	15	2	175,803	1,052	982	— 6.7	906	3	66	7	740,950
West Central Texas	38	47	50	20	2	28	....	2,036	364	283	— 22.3	112	17	154	....	17,379
Utah	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....
West Virginia	38	47	57	11	39	6	1	70	262	316	+ 20.6	39	211	56	10	337
Wyoming	8	6	16	12	2	1	1	2,605	67	54	— 19.4	39	2	5	8	21,020
Total United States	2,661	2,376	3,196	1,964	203	690	339	847,733	15,007	14,425	— 3.9	8,740	1,069	3,187	1,429	4,239,221

[1] Wells completed in 5 weeks, or 35 days, ended June 28, 1941. [2] Wells completed in 4 weeks, or 28 days, ended June 22, 1940. [3] Wells completed in 4 weeks or 28 days, ended May 24, 1941. [4] Wells completed in 26 weeks, or 182 days, ended June 22, 1940. [5] Wells completed in 26 weeks, or 182 days, ended June 28, 1941. [6] California figures from The American Petroleum Institute except for June, 1941. [7] Bradford, Pennsylvania, figures from The Producers Monthly except for June, 1941. [8] Details appear in accompanying table.

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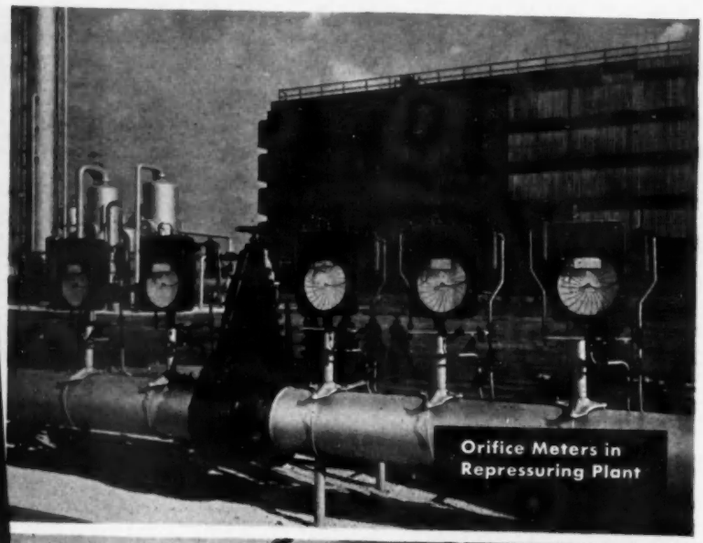
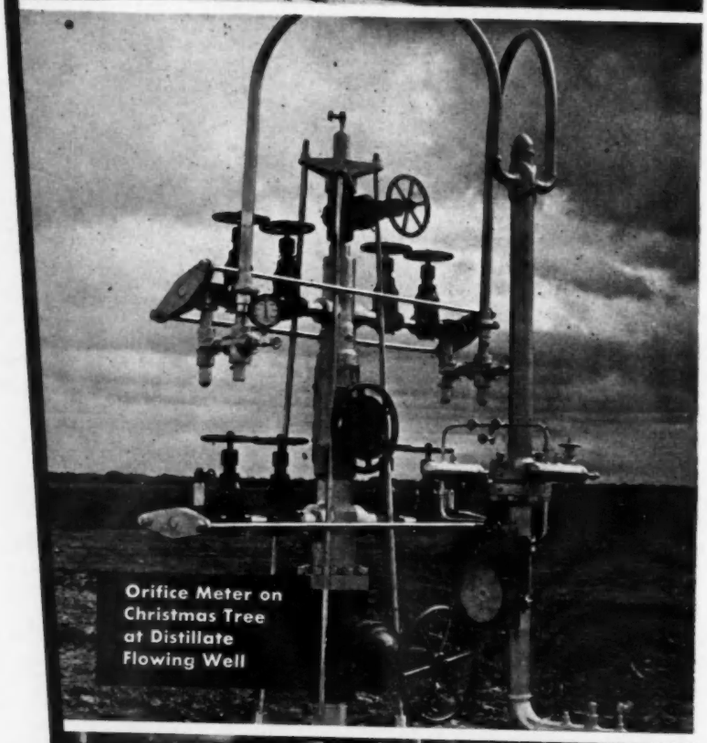
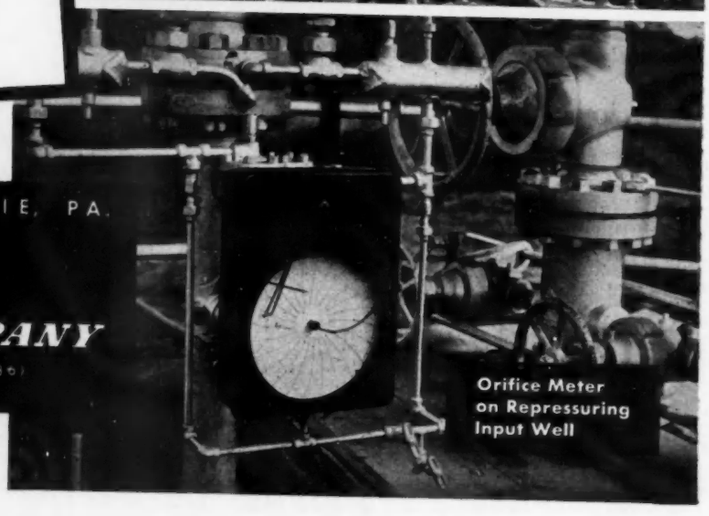


Orifice Meters in Repressuring Plant



Orifice Meter on Christmas Tree at Distillate Flowing Well



Orifice Meter on Repressuring Input Well

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Factors to Be Considered In Determining

Proper Casing Size

By L. E. PORTER
Assistant Manager of Exploitation, Richfield Oil Corporation

THE subject of oil-well casing, its design and use, is as old as the oil industry itself. Much has been published about it, particularly in recent years, and it appears more will be written about it as its full economic influence is brought into bolder relief with respect to the future earnings of any investment of which it is a part, Too infrequently, in a casing program it seems, is it realized that the material with which this subject deals is usually made of steel, and when the "primary" casing strings are landed or cemented in a hole, they forever forego the adaptability and usefulness of the hole to the distinct limitations placed upon it by its "connecting link" of steel.

Importance of Proper Casing Selection

Although recognition has long been given to the importance of the selection of the proper casing program to complete a well; in actual practice, probably little effort or energy is expended, in the majority of cases, toward giving just heed to such recognition. Generally, the casing program is selected, if coordinately determined at all, upon one of three things:

(1) Initial cost;

(2) Materials on hand (to start first wells);

(3) Precedence established in prior wells and fields and followed by "force of habit," or consideration doubtlessly established in the first place by the same conditions as governing in (1) or (2) above.

Thought is rarely given to the real exploitation objective, namely, that a well or wells are usually drilled to obtain the "maximum financial yield for the minimum investment." If such an objective is considered, it must of necessity take in all the oil and the gas which can be produced, inclusive of that portion of oil and gas to be produced by methods other than by the utilization of natural reservoir energy.

Experience records of production in several fields suggest that only 60 to 80 percent of the total oil to be produced will be realized prior to dissipating the energy of the natural reservoir *to a point where mechanical assistance becomes necessary;* thus leaving 20 to 40 percent to be taken care of mechanically during the remaining, and by far the largest, portion of the average well's life span in years, as well as in operating costs. It is during the latter period that the value of the properly designed casing program becomes most apparent. For wells in the average fields of California, the casing costs usually vary between 20 to 38 percent of the total direct cost. Any attempt to create an initial saving by using smaller casing programs will as a rule vary the total investment from about 0 to 15 percent, depending upon the drilling procedure, etc., adopted; therefore, it appears reasonable that for a slightly added cost sometimes a more adequate casing program can frequently be justified as good insurance during the period of mechanical production when 20 to 40 percent of an average well's reserves are to be produced.

To demonstrate the influence of the quantities of reserves produced during the mechanical or latter stages of an average well's life span in California, Table 1 presents typical cases selected from scattered fields believed representative of varying conditions of oil accumulation, production and well depths throughout the state.

Several important features about

TABLE 1

Comparison of Production and Well Life Period Respective Stages of Production

FIELD	Approx. Depth Range (Feet)	Percentages of Columns "A" and "B"						A Accumulative Production (Bbls.) Over "Econ" Life of Averaged Well	B Approx. "Econ" Life Years
		Flowing Stage		Gas Lift Stage		Pumping Stage			
		Prod.	Life	Prod.	Life	Prod.	Life		
Field—A	4800—6000	61	20	10	13	29	67	910,000	12
Field—B	7400—7500	73	17	15	21	12	62	390,000	4
Field—C	2800—4800	53	18	..	..	47	82	480,000	18
Field—D	5900—6000	85	35	..	..	15	65	353,000	5
Field—E	4500—6000	35	10	36	16	29	74	838,000	9
Field—F	3300—3400	78	15	18	28	4	57	1,915,000	13
Field—G	3200—3600	10	4	70	63	20	33	388,000	13
Field—H	6100—6200	56	33	..	..	44	67	120,000	4
Field—I	8900—9600	30*	25*	40*	30*	30*	45*	900,000	24*

* Estimated.

the life of the average producing well, brought out in Table 1, warranting further comment, include these:

(a) That the last pumping stage, and by far the most costly, has represented about two thirds of the life of the well. Therefore, any change in design of a casing program, which might tend to even slightly reduce future clean-out jobs might easily be made to pay dividends after full amortization of such added costs.

For example, in the case of Field A, 67 percent of the well's life, or about 8 years, has, during the pumping stage, according to the best records available, contributed 80 percent of the lifting expense (or about $35,000 per well). The respective casing costs of this group averaged about 32 percent of the total drilling cost. On the other hand, in Field I, one of the more recently discovered deep fields, the pumping stage is estimated to contribute almost 45 percent of the probable life of the well, which, no doubt, will involve as much as 69 percent of the total lifting expense, or about $65,000 for such period. The actual casing cost in this field represents from 20 to 28 percent of the total direct drilling cost. It has been determined, for example, that any casing program varying from a 5⅜-inch to an 8¾-inch primary string (taking all factors into consideration) will not vary the cost more than $3,000 to $5,000 over the life of the well. In connection with this development, it is interesting to note that from 69 to 77 percent of the total expenditure involved in drilling the well is made prior to the insertion of the casing.

In comparing the development costs of Field I with other nearby deep fields, involving formations of the same geological age, it has been determined that the development characteristics are much different, as exemplified by:

(1) The common marker within the top of the Miocene is about 700 feet deeper, while in Field I this marker represents 87 percent of the total depth, as compared to the nearest similar field of 90 percent, but the drilling time to that marker in Field I is 43 percent of the total development time, as compared to the other field's 62 percent of its total drilling time. The number of round trips of drill pipe to the same marker is practically the same in number, but for Field I they constitute 42 percent, while in the other field, they constitute 77 percent, of the total trips; a vast difference when it is realized that Field I has an ultimate depth of almost 1000 feet deeper; thus 58 percent of the total trips are practically at and below the depth of the nearby field.

When such development involves depths below 9000 feet, it is apparent that the work to be done in Field I represents considerably more horsepower in work performance and costs for a replacement of the well than in the field whose total number of round trips is less than one-half to completion than in Field I.

(b) Unlike most of the fields cited here with long past histories, new and comparatively recent California fields, produced from their very inception, under great production restrictions, will doubtlessly show a greater number of years during the flowing stage. In addition, it is doubtful if curtailment practice will necessarily reduce the number of years or ratio of barrels to be produced during such well's mechanical stages. In fact, in some cases the curtailment restrictions per well appear so severe that less ultimate oil during the flowing stage appears reasonable. This discussion is digressing into another problem (i.e. efficient rates for flowing wells) therefore it will suffice to say that a situation of controlled and restricted production should not be allowed to diminish the value of weighing, in the design of a casing program, the provision for adequately taking care of the future oil and gas to be produced mechanically.

(c) That the characteristics for fields given in the Table 1 have varied so greatly that no fixed rule for a casing program would have necessarily applied. For example, Fields B, D and F have derived the bulk of their oil and gas during the flowing stage and any increased expenditures to amplify their mechanical production stage would have to be with economic caution. Fields A, C, E, G and I, on the other hand, would definitely merit a well designed casing program to take care of their latter stages of production.

This brings the problem to an important conclusion that any rule or standard which is to be set up to guide the operator in the selection of his exploitation casing program will of necessity be non-flexible only in that the same points which should govern such a selection will always be given their due consideration in making the selection.

Perhaps one of the first and one of the best technical papers on the subject of casing which most clearly presents the importance of various factors which should influence such selection was by E. K. Parks, on "The Effect of Varying Well-Bore Diameters in California Reservoirs," presented before the Twentieth Annual Meeting of the A.P.I. in Chicago, in November, 1939. (Published by THE OIL WEEKLY, November 20, 1939.) In that paper, it is asserted:

(1) The economies of well or casing design involve consideration of production practice.

(2) The desirability of determining the effect of hole size on production and a study of the perforated section with respect to oil reserves by all operators.

(3) The possibility of evaluating the advantages of additional oil string size for particular development after prospect wells have revealed the physical conditions and production performance.

(4) The tendency of operators, under these days of oil curtailment and accompanying restricted income, to reduce the casing size because:

(a) The first cost or savings are definite and are attractive.

(b) The maximum allowable production per well is still following a decreased trend.

(c) The smaller diameter completion represents a minimum difficulty in the early flowing life of a well.

Important Factors of Every Casing Program

Enumerated herewith are vital factors which should be given due consideration in determination of the design and adaption of any pre-engineered casing program:

(1) The thickness of oil zones to be produced should be ascertained, differentiation between wells of, say, having 100 feet or less with those engaging several hundred feet of zone open for oil and gas production;

(2) The cost and drilling time for various hole sizes should be ascertained as one of the factors in selecting the primary string (water string);

(3) Proper regard to the existence of high-pressure gas horizons between the shoe of the surface string and the shoe of the primary

IMPORTANT STATEMENT BY DU PONT

ON INCREASED PRODUCTION OF

NEOPRENE SYNTHETIC RUBBER

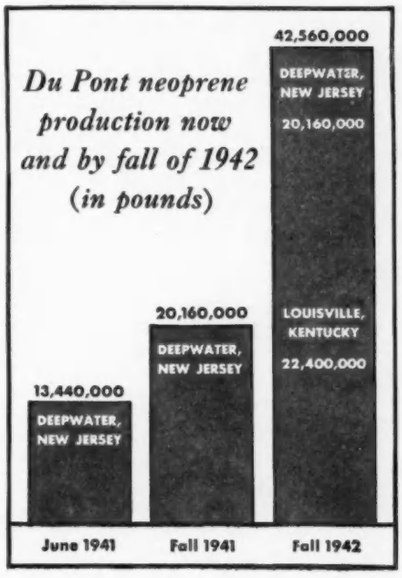
THIS is the tenth year Du Pont neoprene has been in commercial production. Its growth has been phenomenal—from 250 pounds a month in 1932 to *over 1,000,000* pounds a month in 1941.

Much of this phenomenal growth is due to the fact that neoprene has replaced natural rubber in many products, *but* a greater share can be attributed to the fact that neoprene alone has made possible the development of longer-lasting resilient products where natural rubber just could not be used!

It is not surprising, therefore, to find neoprene a *must* in many products vitally essential to the National Defense Program. Nor is it surprising that in March, 1941, the Office of Production Management named neoprene as one of the first five materials to be placed under mandatory priority rule. Aluminum, magnesium, nickel, nickel-steel, and neoprene were placed on the priority list by the Government to forestall possible shortages because each is a unique material, each is unrivalled in its own particular properties, and replacement by other materials a practical impossibility.

Du Pont to meet need for more neoprene

Before the end of 1941 additional manufacturing facilities under construction at Deepwater, New Jersey, will add almost 50 per cent to the present neoprene production. This will give a total annual output of over 20 million pounds.



This was the situation when plans were recently announced for "A new neoprene synthetic rubber plant at Louisville, Kentucky, to be built, financed, and operated by Du Pont." The total annual output by the end of 1942 will be 42,560,000 pounds of neoprene. The output of the Louisville plant alone will be *larger than the combined output of all synthetic rubbers today, including neoprene.*

Construction has already started on this new plant. The chart (left) shows how the completion of this plant will triple present production of neoprene.

When will neoprene again be available for normal commercial uses?

This question cannot be answered, because no one knows the ultimate requirements for defense purposes. It is expected, however, that the increased production facilities at the Deepwater plant will provide sufficient neoprene for renewed research and development work and possibly for some of the normal industrial requirements. Completion of the Louisville plant in the latter part of 1942 should assure an adequate supply of neoprene.

We suggest that you keep in touch with your source of supply for neoprene products. Also let us keep in touch with you by adding your name to the mailing list of the Neoprene Notebook. To keep informed about new uses, interesting data, and latest news about neoprene, get the Notebook now. Just send us your name and address. E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington, Delaware.

DU PONT

NEOPRENE *America's No. 1 Synthetic Rubber*

water string, and their respective influence, if any, on hole size, mud weight, etc.;

(4) Determination of the characteristics of the producing zones as to whether it is advisable to set the primary strings at the top of the producing horizons prior to drilling into them. In this connection, added consideration should also be given to:

(a) The drilling costs for the size of the hole to be drilled in the producing zone, inclusive of core recovery, if coring is to be done.

(b) The relative efficiency of the hole to be drilled on the ability to perform future remedial work, deepening, etc., subsequent to the original completion.

(c) Costs with respect to future (b) above.

(d) The influence of drilling fluids upon the section of zone to be produced and whether by setting at the top of the producing zone prior to entering a complete change-over of drilling fluid is warranted, so that a lighter weight fluid, nearer the hydrostatic pressure of the formation, can be used.

If the zone to be produced is affected by drilling fluids, the time element for keeping the hole open to such fluids should be held to a minimum. This should be axiomatic.

(5) Advantages of larger hole size (if any, within practical limitation of size) over the small bore hole in future oil and gas recovery.

(6) The mechanical influence of the size of oil strings and liners upon future production methods, particularly with respect to:

(a) Special gas lift and flow devices;

(b) Existing pumping methods for deep-well production;

(c) Size of tubing, etc. under conditions of "waxing" as well as flow friction with long strings;

(7) The mechanical flexibility of various casing combinations which will permit cementing through perforations to exclude certain high pressure gas zones, retaining them for future production or natural gas lift purposes when the present zones have been depleted to the point that the oil content can no longer be "flowing" or produced by mechanical means.

(8) In "high" gas-oil ratio wells involving several hundred feet of zone, due consideration should be given to casing sizes, so as to permit mechanical flexibility (this problem is related to (6) above for controlling gas-oil ratios by means of:

Tubing size
Packer type flow devices
Bottom-hole beans.

(9) The influence of hole and casing size during the pumping stage of a well, particularly with respect to the operator's ability to clean out sand, bailing operations, etc., see (4) above.

(10) The application of the law of averages of casing failures and the necessity of plugging operations, as may be determined from a study of operating conditions in similar fields at similar depths.

Additional Points—In Choosing a Casing Program

(a) The kind of a casing program which is permissible or best suited for development will likewise be largely influenced by what is known of the foregoing factors: the magnitude of the development to be initiated; and the character of such development. If the producing zones and reservoir performance are largely unknown quantities, the casing program used until they are determined should be kept sufficiently large as to make it flexible enough to meet foreseen conditions.

(b) Once the subsurface conditions become known factors, or reasonably so, the specific casing program to be adopted should be for a specific purpose. If the specific conditions dictate a small diameter casing program, it should be used. If they do not, the wells should be designed so that for the small extra investment (in most fields) the proper casing will be used toward making a greater profit rather than limiting the initial cost in an attempt to preserve the small difference as a saving.

A slim-hole casing program is generally practiced only when a new hole can be drilled at a cheaper cost than a redrill or remedial job or when the operator wishes to take the hazard that production equipment technique will be able to progress rapidly enough to meet the mechanical production problem when the wells reach such a stage.

(c) In considering the design of a casing program for the mechanical or last stages of the producing well's life, it must be remembered that the deeper wells ever involve a more complex problem than do the shallow wells. Meeting their deep-well-pumping problems, a number of California operators, particularly in Kettleman Hills, Long Beach, Santa Fe Springs and other fields, have employed numerous hydraulic pumping systems. The amount of fluid which can be lifted depends largely upon the pump size which can be inserted into the well at sufficient depths to produce the ever decreasing fluid levels. It is found, for example, at a depth of about 8400 feet under operating pressure of around 3800 pounds, that a 3-inch pump successfully handled from 125 to 350 barrels per day, whereas a 4-inch pump operated successfully at approximately 425 barrels per day. Therefore, the success in moving proper quantities of fluid, in the face of ever increasing cuts which usually manifest themselves during the pumping stage, will undoubtedly exert a great influence on the adequacy in the size of pump and the strength of materials for performing the job at great depths. If these mechanical stages applied to the well are to be disregarded, then, of course, the larger sizes of casing are not so paramount.

(d) An interesting feature has been recently brought to light in some of the deeper wells in Long Beach on the limitations of small casing programs. This proved so when a sonic fluid level determining service was being used in order to determine the operating fluid levels in the wells. With wells involving 3½- to 4½-inch oil strings or liners of great length, the fluid level tests were worthless, because of the small size casing, thus dictating such determination to more difficult and more costly means of fluid-level determination methods. On other wells located on the same leases, having 5½- to 6⅝-inch oil strings or liners, complete fluid level records were obtainable; the possession of which has proven an advantage to the operators in keeping their subsurface pumping equipment apace with their working fluid levels.

Conclusion

The size of an oil string or liner to be used in any casing program shall apply to the given conditions on the property or the field itself. Every program must be based on seeing and meeting individual conditions. The determination of these individual conditions can only be had by answering at least some of the questions which have been propounded in the section of this paper on "important factors which should be studied in the design and selection of every casing program."

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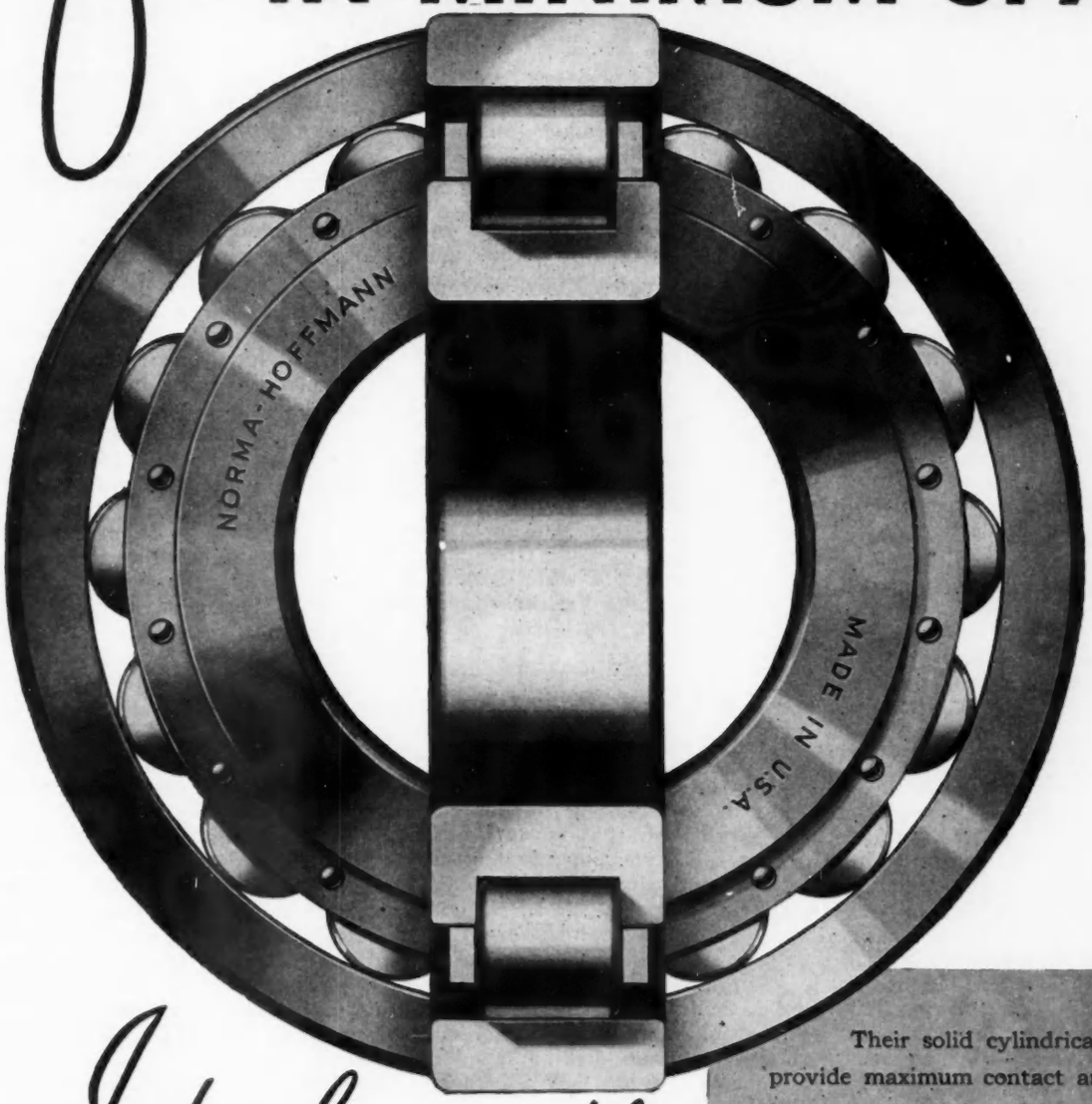

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Their solid cylindrical rollers provide maximum contact area, giving larger load and shock-absorbing capacity than any other single-row bearing of like dimensions. Thus, when NORMA-HOFFMANN PRECISION ROLLER BEARINGS are used in place of ball bearings, a greater factor of safety is provided, together with added life, particularly under vibration and overload. PRECISION qualities in workmanship and materials adapt them alike for both low and high speeds.

Speed and Mobility Have Lowered Drilling Costs

OIL operators have been confronted with a period of considerable economic stress in recent years, a situation created by the necessity of continuing to invest additional capital in new wells during a time when per-well incomes were declining because of production curtailment in most states and with relatively low prices for crude. Low margins of profit almost invariably stimulate search for operating economies, and this certainly has been true of drilling operations. Speed and economy, which frequently go hand in hand, are the theme of modern drilling technique.

There have been very substantial reductions in drilling costs as a result, which have so lessened the investment in new wells that it has been possible for the industry to complete upwards of 30,000 tests per annum during relatively poor economic conditions and still anticipate a profit from such expenditures.

Lower cost of rotary drilling has been achieved without radical technique or machinery changes, but through gradual refinment of methods used previously, that have improved the efficiency of modern rigs many fold. To make hole the bit must be rotating on bottom. All other rig operations are non-productive. The trend in modern drilling practice and equipment has been to increase the time spent on bottom actually digging hole, to dig more hole per hour, and to provide for faster dismantling, moving and erection of rigs. Thus non-productive drilling time has been reduced to a minimum, and productive time has been boosted to a maximum. Additional savings have been attained through use of fewer and smaller casing strings, longer service life of modern equipment and many other factors, but all have contributed to improve efficiency. Many of the advancements when considered individually have been small, but the aggregate effect has been large.

Costs have been reduced in many instances by eliminating some of the "unnecessary" drilling. For example, the Gulf Coast area, once noted for close spacing, has developed many fields on 20- and even 40-acre spacing patterns in recent years; and the State of New Mexico has 3000 wells on 40-acre spacing. Similar trends may be found in many other regions. The drilling of fewer wells per acre lessens the capital investment required to develop a property, and consequently smaller quantities of production are needed to make it a profitable enterprise. However, actual reduction of well costs has been of greater and wider benefit, for it has lessened the investment in those tests that have been drilled.

More and Faster Drilling Time

Whereas round trips formerly occupied one third[1] of the drilling time in the Gulf Coast area, today going in and coming out of the hole requires but about one fifth of that spent rotating on bottom. Fewer round trips are made today, due to improved bit, tool-joint and drill pipe service, and those that are necessary have been reduced by faster hoisting speeds and improved drill pipe that permits more rapid stabbing and spinning. Meanwhile, the average drilling speed in the coastal region has increased from 5 to 50 feet per hour. Similar progress has been made in other regions.

These achievements have combined to speed up drilling operations four to five times in the past decade, with remarkable strides made in the past few years providing many new speed records. No more than 12 days are required to drill to 6000 feet in the Gulf Coast territory, while 10 years ago wells 3000 feet deep needed 30 days. In California, 12,000-foot tests are being drilled in 45 days and 11,000-foot holes are being completed in 35 days. One West Coast test reached 11,233 feet in 27 days. Consequently, costs for drilling have been reduced materially. Fewer rigs are required to complete a given number of tests, thereby reducing the investment in tools along with labor costs.

As an indication of what the speed and economy resulting from the rapid improvements in technique and equipment has meant, an 11,000-foot well may now be completed at approximately the same cost as a test of but half that depth in 1926. These achievements have been made possible by constant research on the part of competent engineers, chemists and metallurgists, and the wholehearted cooperation of manufacturers in design and fabrication of equipment to meet the demands for ever greater speed and economy.

Bit manufacturers have improved their products and contributed greatly to the reduction in drilling costs. Bits in use today have been made many times more serviceable by modern metallurgy and refinements in design, which have not only increased their rate of penetration per hour but total footage capable of being drilled without change. A bit making 1000 feet without changing is not at all rare. Studies of the performance of various styled bits in different formations also have been a factor contributing to this end, as they have permitted the selection of the proper bit for each type of stratum.

A definite reduction in tool-joint failures has taken place since the industry's break away from old standard tool joints. Many types of patented joints, threads and variation in upset practice have been introduced. Since the development of the integral joint, the trend to larger external upset diameters and the introduction of new thread designs whereby joints are made up tight to a shoulder, the number of twist-offs has been lowered considerably and the service life of both joints and drill pipe have been prolonged.

These developments, coupled

A Continental Combination
Custom-Built
To Meet Your Drilling Needs

Emsco STAIR-STEP DRIVE

THREE ENGINE—FOUR SHAFT TRANSMISSION

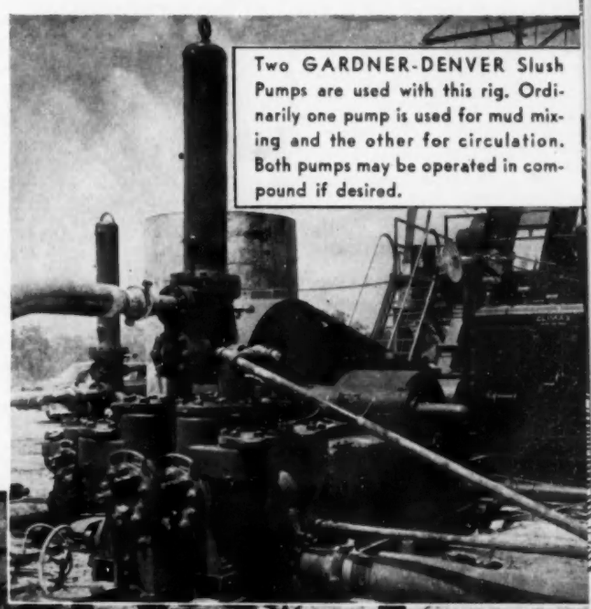
Climax ENGINES ▲ *Gardner-Denver* SLUSH PUMPS

HERE is a custom-built rig, produced especially for the needs of a South Texas contractor who required a drilling unit easily moved and rigged up, flexible in operation, easy to service and maintain, and suitable for depths of 6,000 feet or more.

This rig may be assembled and broken down with exceptional convenience. The transmission, reverse gear and drawworks substructure can be moved short distances in the field on the transmission section of the panel type main base. Likewise, the three engines are moved with the other main base section.

Complete flexibility of power is an outstanding feature of this rig . . . three engines may be compounded or one disengaged for rotary service while the other two may be used in compound for slush pump service. Similarly, one engine may be used for mud mixing, a second for slush pump service, and the third for rotating . . . virtually any combination of power can be obtained.

All this equipment is quality machinery backed by the long experience of Continental and its affiliated companies. If you need a rig of specialized design, ask your Continental representative to furnish specifications and prices.



Two GARDNER-DENVER Slush Pumps are used with this rig. Ordinarily one pump is used for mud mixing and the other for circulation. Both pumps may be operated in compound if desired.

This picture shows the excellent arrangement resulting from the EMSCO three-engine, four shaft transmission. All component equipment is located within a confined area, yet is easily accessible for adjustment and inspection.

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with the fact that shutdown time due to machinery defects is at a minimum, have made drilling much faster and economical.

Faster Rotation Speeds

An aiding influence in obtaining more footage per hour, besides the improved design of bits and selection of a style best suited for the formations being penetrated, has been the trend toward faster rotation speeds. This has been especially noticeable in deep drilling, and the highest rotary table speeds [2] [3] in the world are used in California deep areas. In a few instances speeds above 700 revolutions per minute have been reported, but the highest speeds ordinarily used in the San Joaquin Valley fields are around 500 revolutions, with 300 revolutions per minute still the most common. To meet the requirements of such fast rotation, rotary tables designed for 1000 revolutions per minute have been built.

An outstanding feature of successful high-speed deep drilling has been the use of extra long and heavy drill collars. As much as 360 feet of drill collar, composed of six 60-foot sections, have been used to control the weight and place it near bottom. Some operators have used 240 feet of 8¼-inch O.D. drill collars, made up of four 60-foot lengths. Such a long, heavy drill collar places the desired weight on the bottom of the hole, which permits holding the drill pipe continuously in tension so it can function merely as a power-transmitting medium. This practice is thought to have influenced the foot drilling rate and improved the performance of the drill string.

A separate engine for driving the rotary table has become popular in connection with high-speed rotation, although such hookups also are used under ordinary rates of rotating. The original separate table drive was by a small twin vertical steam engine, direct-connected on the derrick floor, and this is still a common practice. Another type of individual table drive is to use a regular twin horizontal steam engine set at ground level directly beneath the derrick floor, and a 12 x 12 horizontal steam engine has been set on the derrick floor.

The disproportionately large amount of unproductive time formerly spent in dismantling, moving and setting up the drilling rig has been shortened from days to hours, and has been a most important factor in the reduction of drilling costs. Continued advancement has been made in unitizing equipment, which usually means the placing of different equipment units on skids, until the minimum amount of time is required to commence drilling at another location when one test is completed. A number of concerns have adopted programs of skidding completely erected rigs, including derricks, in the case of short moves. In shallow and medium drilling, there has developed a distinct trend toward use of truck-mounted units, many of which include collapsible derricks that may be raised in a matter of but few minutes.

The importance of increased mobility cannot be over emphasized; for example, the average Illinois rig moves from 40 to 50 times[4] a year. Two or three years ago a medium weight unitized Illinois rotary rig would have required from 6 to 8 truck loads, while the modern unit can be moved in from 3 to 5 trucks. To move, rig up and set surface pipe within 24 hours is common throughout the state. A saving of $500 or more per move runs into a sizeable financial item in a short period, and in areas using heavy-duty rigs it amounts to much greater sums for individual moves.

The trend toward unitization of drilling equipment has been extended to include auxiliary machinery as well as the more major pieces or units. Practically every item on a modern rig is provided with means for making location moves faster and easier, in many instances provisions even being made for more convenient transfer of pipe. The latter is accomplished in many instances by the building of cradles or racks for all pipe and connections used about the rig. Modern rig lighting systems are unitized and employ prefabricated wiring circuits that may be taken down and erected with rapidity. Metal mud partitions and sample boxes are in common use, thus saving the labor and expense of rebuilding them on each job. In all cases connection work is simplified by use of quick-change units so that piping can be disconnected and reconnected in units rather than completely torn down. There are a thousand different ways of accomplishing each of these phases, but all serve the desirable purpose of cutting down on dismantling, moving and erection time.

Some companies have developed systems whereby movable grillages of steel beams or steel pedestals are used to eliminate concrete derrick foundations, further reducing the non-salvageable investment. Many of these have means of adjusting their height, advancing the speed and ease with which derricks may be lined up and kept in a true vertical position.

With the development of portable servicing rigs with collapsible derricks designed to handle up to 10,000 feet of tubing and rods, it has become a prevalent practice in many areas to remove the derrick from the well site upon completion of drilling work. This permits one derrick to be used during the drilling of many wells, which, of course, has reduced investments materially.

The desire to take advantage of the economic possibilities offered by removal of the derrick when wells are put on production, has, to a large extent, helped create a pronounced trend toward streamlining drilling equipment into truck-mounted units. Many 3000- and 4000-foot tests and some to deeper depths, have been drilled with such equipment. Some of the earlier truck-mounted assemblies carried only the drilling machinery, which was backed up to the derrick. This was followed by use of prospecting core machines for drilling work, and which resulted in the development of extension masts that fold horizontally over the top of the truck when being moved and may be raised to vertical drilling positions as rapidly as pulling a single stand of drill pipe. In addition to the derrick, they are complete with rotary table, kelly, drawworks, power takeoffs, mud pumps and other items installed on the truck bed in permanent positions. As can be appreciated readily, moving and erection expenses are reduced to an absolute minimum, while the time of getting to a new location becomes a matter of driving speed.

Other specially designed units that have the derricks, mud pumps and engine units mounted on wheels as individually assembled sections have been developed. One such rig [9] consists of three major pieces: (1) an 87-foot derrick, drawworks and engine; (2) a 40-foot by 16-foot pipe rack; and (3) the mud pumps and their prime movers. Each of these is mounted as a self-contained separate unit on track-laying wheels, which can be moved and maneuvered by attaching a tractor to special draw-bar steering apparatus. The sub-structure of each unit is constructed of

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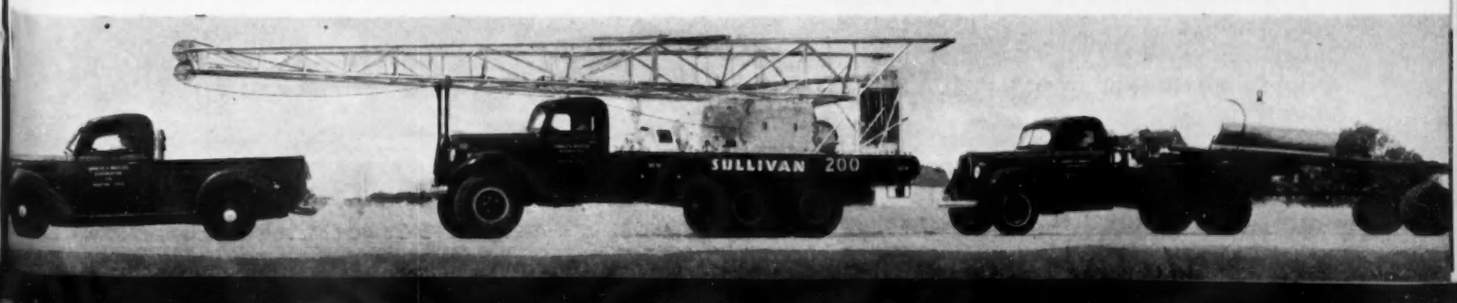

bolted and welded heavy steel I-beams, which can be broken down into sections and then reassembled quickly. When spotted and joined together they become a smoothly functioning drilling rig. Such additional features as provisions for moving the rotary table several inches to one side or another so it is not necessary to loctae the derrick exactly over the center of the previously prepared cellar and use of hinged pedestals as derrick corner foundations during drilling operations, further reduce the delay in starting drilling operations at a new location.

Other operators, especially where depth requirements necessitate use of heavy units, have devised means of skidding completely erected rigs to new drilling sites. One of the earliest efficient derrick-skidding methods[5] adopted consisted of the use of four special skid shoes placed under the corners of the derrick substructure, and the moving of the substructure and derrick as one unit. It was found that one large crawler type tractor and winch provided enough power to move a heavy derrick under good conditions, and that a second and third tractor could be used whenever needed. Except where the terrain was exceptionally rough, little difficulty has been experienced in skidding derricks in this way. Another early method[6] was to skid the derrick on wooden rollers that moved along wooden tracks laid down as moving progressed.

Another innovation of this same general type has been the development whereby steel derricks may be assembled horizontally[7] on the ground and then raised to their upright position as a single unit. The derrick is fabricated in five sections, each a bolted and welded unit, which can be moved without difficulty to new locations. After these sections, one of which is the base, have been connected together on the ground, the derrick is jackknifed into a vertical position by the drawworks. The top section is complete with crown block and safety rail fixed in position.

Slim-Hole Drilling

Another innovation in the effort to reduce drilling costs was introduction of slim holes. Reduction in hole size results in great savings in bit, fuel, reaming, casing and mud costs.

There are two different styles of rotary drilling units being used for slim holes. These are (1) the lightweight conventional rotary outfit for deep tests, and (2) the machine unit mounted on trucks or other moveable chassis for shallower drilling.

The use of slim holes has been largely for exploration work, although used by some operators for production work also. In Illinois, and other shallow regions, those completing slim-hole producers may dig a 6¼-inch hole and run 4½-inch or 5-inch casing as flow strings.

Application of smaller diameter hole sizes to deep producing areas has been an important development in recent California drilling operations, outstanding among which has been work conducted by one company in the Ten Section field. Early wells were completed with a conventional program, 11¾-inch surface pipe being set at approximately 1000 feet and a 7-inch 8200-foot flow string was landed on top of the sand. The next step was to reduce the surface pipe to 9⅝ inches, then to drill a 8½-inch hole with 4½-inch drill pipe that was cased with regular 4½-inch casing. After experimenting with other different sized holes and drill pipe, the concern finally standardized on the use of "drill-casing," in which specially designed pipe used as drill pipe becomes the regular casing. The cement is then drilled out with two-inch tubing that becomes the regular tubing string. The latest method even leaves the bit with which the cement is drilled on the bottom of the tubing string. Needless trip in and out of the hole and making up and breaking out of pipe is avoided. The usual program has been to use 4½-inch drill-casing, but the company is now experimenting with 5½-inch drill casing. The average time for drilling Ten Section wells has decreased approximately 10 days since use of drill-casing was inaugurated, and other economies have been obtained.

One of the principal economies of slim-hole drilling is the saving in amount of casing used, and this is true of regulation diameter hole programs also. Use of four strings of casing in 8000-foot wells was a common practice prior to 1935 in California, but today only two primary strings are used in most instances. In the East Coalinga field a representative drilling program requires 11¾ or 13⅜-inch casing at 600 or 700 feet, 7-inch pipe at around 8000 feet, and a 5-inch liner through the producing section.

Recent years have witnessed great extremes in the depth of drilling, and likewise, as would be expected under such conditions, in the type of equipment used in performing drilling operations.

In California and the coastal area of Texas and Louisiana many exceptionally deep tests have been drilled, a large number exceeding 10,000 feet. For these deep operations, some of the heaviest rigs ever built are in use.

In Illinois, Kansas, North and West Texas, intensive drilling campaigns have occurred with average depths ranging from only 2500 to 4000 feet. In designing rotary equipment for such shallow and medium depth drilling, efforts have been devoted toward scaling down of the size as much as possible and still maintain ample strength for service and maximum flexibility. Smaller drums, crown and traveling blocks have been made possible by the use of 1-inch and ⅞-inch drilling lines for depths up to 3500 feet. Prime movers, pumps and other items have experienced similar reductions in size.

Development of hydraulic couplings or torque converters has been a notable advancement for the internal-combustion-engine rig. Through their use an infinite number of speeds are obtainable with instant application of maximum power when needed. These converters, placed in the shaft to absorb shock between the engine and the pumps or drawworks, transmit a constant torque at reduced speeds when sudden loads are developed and also assist in synchronizing speeds when pumps are compounded. Friction clutches have been perfected to a point where the square-jaw clutches can be eliminated in heavy internal-combustion-engine-driven drilling for all but the low speeds. The former practice of attempting to adapt internal-combustion engines to drawworks designed for steam has been supplanted by drawworks designed with friction clutches, enclosed chain or gear box transmissions and reduced number of shafts. As a result of these and other improvements, costs have been reduced, portability has been improved, and operating flexibilities have been increased.

There have been many improvements in steam equipment and auxiliaries in recent years, most of which have promoted steam saving by feedwater preheaters, insulation and superheating; and greater

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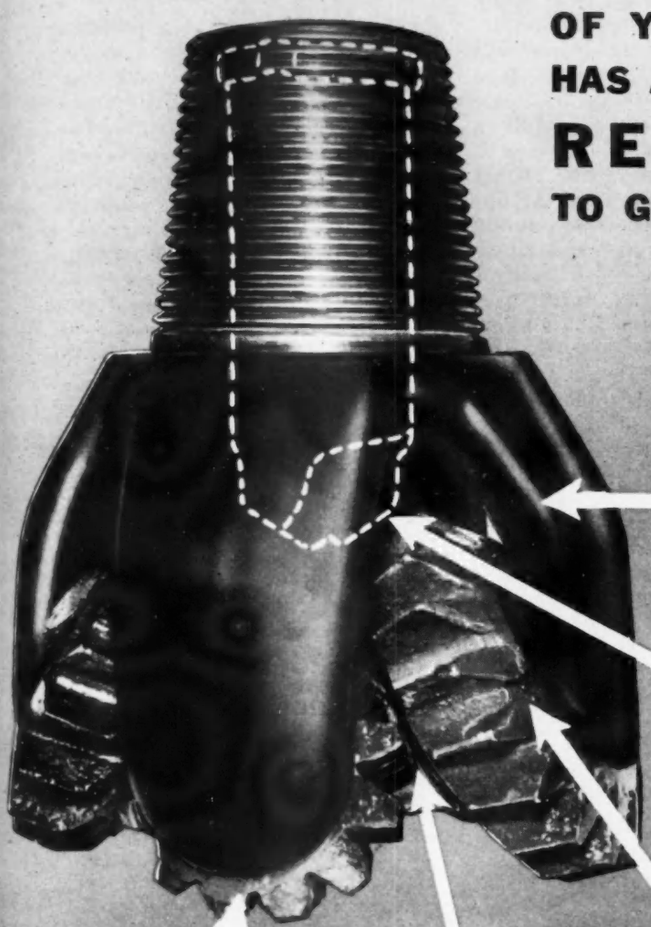


FORGED INDIVIDUAL SUPPORTS FOR EACH CUTTER

REPLACEABLE SLUSH NOZZLE ASSEMBLY FOR SELECTION 'AT THE RIG' OF CORRECT SLUSH ACTION

GREATLY INCREASED BEARING SUPPORT, AND ACCURATE BALANCE

ALL CUTTER TEETH AND GAUGE BEVELS HARD FACED WITH "REEDITE" FOR WEAR RESISTANCE AND INCREASED FOOTAGE

INDIVIDUALLY SUPPORTED CUTTERS "UNITIZED" FOR GREATER SAFETY AND FULL GAUGE HOLE

REED ROTARY DRILLING TOOLS

REED ROLLER BIT COMPANY

POST OFFICE BOX 2119 HOUSTON, TEXAS

steam-generating capacity per unit of weight and size.

The modern heavy-duty diesel-electric rig, improved in flexibility by advance controls and transmissions, may consist of two 350-horsepower diesels running 600 revolutions per minute to drive 250- and 200-kilowatt generators. The shafts of the two generators are connected together at will for heavy hoisting duties, but while drilling the larger generator would drive the pump motor and the smaller the rotary. A single large hoisting motor drives both the drawworks and the rotary table.

The majority of recent improvements in the completely truck-mounted rotary rigs have followed the line of refinement, with the exception of improved derrick structures. Greater attention has been given to detail engineering and fabrication, with the result that parts causing difficulties in the past have been perfected, and modern truck units are more dependable and complete.

Large rotary rigs have been used for some time, but the more active deep-drilling trend which started in 1938 resulted in the general adoption of what can be classed as truly large rigs. Considerable advancement in drilling equipment has followed, and most of the remarkable deep drilling records that have been established have been made with these larger and improved machines.

The largest rig[8] in the world was placed in operation in California in March, 1940, and has been in steady operation since. On its first test it drilled 11,223 feet in 27 days. It uses an 8000-pound fully-enclosed 3-shaft 3-speed drawworks mounted on 28-foot skids, with a 32-inch diameter by 58-inch drum having a 62 x 10⅜-inch brake rim. The old conventional arrangement of chain drives was modified so that the high and intermediate speed drives are direct from the jack shaft to the drum shaft, with one drive on each end of the shaft. The low speed, which is seldom used, is accomplished through chains up to the line shaft and back to the jack shaft. A 40-inch double-rotor hydromatic brake is used to handle the heavy loads. This drawworks, with its 15 x 14 inch driving engine, can handle all but the heaviest loads in high gear, with consequent reductions in pulling time. A second drawworks on this rig is a four-speed outfit, in which the jack shaft to line shaft drive has been put outside of the posts, thereby allowing the line and jack shafts to be brought closer to the drum, making a more compact unit with greater accessibility to brake rims.

This giant rig uses two steam pressures. The 15 x 14, 2000-horsepower twin-cylinder drawworks engine, 22-inch mud pumps, feed water pumps and generators operate at 500-pound steam, while a 12 x 12 rotary table drive and standby engine and one slush pump employed in mud-mixing operations operate at 350 pounds steam pressure. A pressure-reducing regulator reduces the steam pressure for the latter units from 500 to 350 pounds. The steam plant consists of five 140-horsepower, 500-pound working pressure firebox, superheat boilers with long stacks, and blowers in the stacks. Water feed is automatic and boilers are fired independently.

The year saw the drilling of the deepest electrically drilled test in history, which in reaching 14,600 feet became one of the world's deepest. A three-shaft drawworks is driven by two 125-horsepower alternating current motors synchronized through a reduction gear. A 125-horsepower 6-cylinder internal-combustion engine is used as standby hoisting power, being connected by chain drive to a calf wheel on which the "dead" line is spooled. This gasoline engine also drives the wire-line coring reel. An unusual feature is the use of a 125-horsepower alternating current motor as a direct drive on the rotary table.

The 178-foot tall 32-foot base derrick has been adopted extensively for deep operations in California, although the 136-foot 30-foot base derrick is still in wide use there as well as elsewhere. With the larger derrick there is more room for standing the long strings of drill pipe, and by using 120-foot stands greater speed is possible in making round trips. However, some operators still prefer to use 90-foot stands because of the tendency of small drill pipe in long lengths to become wobbly.

A feature of the large heavy-duty rigs is the use of high steel substructures, ranging upward to 14 feet, which have eliminated the necessity of digging cellars and permitting the placing of drilling control valves in more accessable locations. These high subsctructures have given impetus to the use of steel mud tanks, controlling sluiceways and the practical elimination of old excavated mud pits.

Present types of heavy-duty crown and traveling blocks have large diameter sheaves that are adequate for 1¼-inch wire lines needed to handle the heavy loads encountered in deep drilling. At the same time narrower traveling blocks have been designed to give more clearance in the derrick when racking long strings of drill pipe.

Faster and deeper drilling has stepped up rig power requirements at both principal consuming points. The drawworks engines must deliver augmented power to cope with drill pipe two miles or more in length, and pump pressures must be higher to deliver sufficient mud flow at greater depths.

To meet the requirements for larger mud volumes, slush pumps have been made larger, ranging up to 15½ x 9¼ x 22-inch units for operating on 500 pounds working steam pressure and cast steel mud ends rated at 3500 pounds. At 60 strokes per minute these pumps can deliver 1450 gallons of mud per minute. A 3-cylinder 17 x 7 x 20-inch slush pump, the primary object of which is to provide high pressures without compounding and to circulate a large volume of fluid with one pump, has been used in drilling of two deep California tests. On one well, using 6-inch liners, this type pump maintained a fluid pressure of 2800 pounds per square inch while operating at 38 revolutions per minute, with 290 pounds per square inch steam manifold pressure.

To accomodate the increased volume of mud and lessen the flow friction, there has been a constant drive to enlarge the diameter of the free opening within the pipe and tool joints, and swivels with full size fluid passages through the gooseneck, wash pipe and body have been introduced.

[1] George B. Corless and Fred N. Wise, Humble Oil & Refining Company, "Oil Development and Production Practices in the Gulf Coast Area," before the Southwestern District of the American Petroleum Institute Division of Production, 1940 meeting.

[2] "Improved Practices Permit High-Speed Deep Drilling," Brad Mills, THE OIL WEEKLY, July 31, 1939.

[3] "Rapid Penetration With High Rotary-Table Speed," THE OIL WEEKLY, February 10, 1941.

[4] A. F. Lager, The Sioux Company, "Review of Illinois Drilling Practices," before Eastern District meeting of American Petroleum Institute Division of Production, THE OIL WEEKLY, April 21, 1941.

[5] "Derrick Skidding Now Highly Skilled Art," Brad Mills, THE OIL WEEKLY, August 3, 1938.

[6] "Derricks Moved Intact on Rollers to New Location," Porter Flint, THE OIL WEEKLY, September 26, 1938.

[7] "Derricks Being Assembled Horizontally on Ground and Raised As Unit," Frank B. Taylor, THE OIL WEEKLY, September 4, 1939.

[8] "Heaviest Drilling Rig Points Way to Lower Drilling Costs," THE OIL WEEKLY, April 22, 1940.

[9] "Unitizing Speeds Up Operations on Highly Portable Unit," THE OIL WEEKLY, June 23, 1941.

Wells Deeper and Footage Off Less Than Completions

WELLS completed in the United States in the first half of this year were considerably deeper, on the average, than those finished in the first six months of last year. Consequently, while there have been 3.9 percent fewer completions this year than last year, for the first six months, the amount of footage drilled has been only 9/10 of 1 percent less.

These figures are indicated by statistics which show that from January through June, 1941, 14,425 wells were completed, through the drilling of 43,246,211 feet of hole in new wells and in old wells deepened, an average of 2998 feet per well. In the like period of 1940, there were 15,007 completions, and aggregate footage involved was recorded as 43,658,934 feet, which indicated an average depth of 2909 feet per well.

This journal, effective January 1, 1941, began computing footage somewhat more exactly, having eliminated slight inaccuracies previously involved; and consequently, footage figures for this year are not exactly comparable with those shown for last year, although they are practically so. The circumstances involved in this situation are such that footage for this year actually is down from last year a little less than the above comparison indicates.

Since the beginning of this year, footage recorded has included only that of new wells plus actual footage added in deepening operations. Previously, the footage figures included hole drilled in new wells, considered deepened wells as new wells (by counting their total depths as footage drilled), and included several hundreds of plugged-back wells annually (largely in Oklahoma and Kansas), which likewise were treated as new wells.

The above figure showing a decrease this year of only 9/10 of 1 percent in footage drilled, accordingly, would have been smaller—or a slight increase might have been indicated — if the artificial footage for last year were eliminated, an adjustment that would require more work than its importance justifies.

Through elimination of wells drilled deeper, it is found that new wells completed in the first six months of this year totaled 14,070 and that they had depths aggregating 43,068,992 feet, or an average of 3061 feet per well.

Similarly, the deepened wells were 355 in number, and they were drilled deeper in the aggregate amount of 177,219 feet, an average of 499 feet per well.

South Louisiana remains the foremost deep-drilling area, its completions of this year having averaged 7724 feet per well. The Texas Gulf Coast follows with an average of 6512 feet per well, and California ranks third with a 5708-foot average, while the wells of the Corpus Christi area of Southwest Texas this year have been 5491 feet deep, on the average.

Average Drilling Depths

(Data revised back through 1913 to show Bradford, Pennsylvania, completions on **The Producers' Monthly** basis.)

YEAR	Wells Completed	Footage Drilled	Average Depth per Well
1925	25,406	73,677,400	2900
1926	28,995	81,186,000	2800
1927	22,301	66,903,000	3000
1928	19,964	59,892,000	3000
1929	23,463	67,925,285	2895
1930	19,848	57,557,200	2900
1931	11,716	34,259,110	2924
1932	14,290	43,033,422	3011
1933	13,145	38,464,500	2926
1934	20,793	55,103,538	2650
1935	24,273	66,632,035	2745
1936	28,546	80,068,851	2805
1937	33,945	101,105,230	2979
1938	28,060	87,841,493	3131
1939	27,658	84,114,990	3037
1940	30,656	93,971,162	3065
First Half:			
1940	15,007	43,658,934	2909
1941	14,425	43,246,211	2998

Footage Down Very Little; Completions Fewer But Deeper

Prior to 1941, deepened wells were treated as new wells, with total depths counted as footage drilled, and some plugged-back wells were included as completions. In 1941, figures are more exact, showing actual footage added in deepening operations and eliminating plugged-back wells.

STATE OR DISTRICT	COMPLETIONS 1940 1st Half	COMPLETIONS 1941 1st Half	COMPLETIONS Percent Change	FOOTAGE DRILLED 1940 1st Half	FOOTAGE DRILLED 1941 1st Half	FOOTAGE DRILLED Percent Change	AVERAGE DEPTH 1940 Entire Year	AVERAGE DEPTH 1940 1st Half	AVERAGE DEPTH 1941 1st Half
Alabama	1	1	.....	645	305	— 52.7	3477	645	305
Arkansas	93	80	— 14.0	556,047	326,990	— 41.2	5169	5979	4087
California	545	560	+ 2.8	3,303,619	3,207,436	— 29.1	6245	6062	5708
Colorado	3	8	+166.7	8,318	22,219	+ 167.1	3414	2773	2777
Illinois	1,791	1,655	— 7.6	4,565,394	3,714,209	— 18.6	2473	2549	2244
Indiana	197	250	+ 26.9	378,752	503,997	+ 33.1	1871	1923	2016
Iowa	.....	2	.....	.....	6,274	.....	1300	.....	3137
Kansas	892	1,046	+ 17.3	2,827,817	3,123,084	+ 10.4	3144	3170	2986
Kentucky	136	143	+ 5.2	144,850	178,525	+ 23.2	1023	1065	1248
Louisiana	804	670	— 16.7	4,257,002	4,007,203	— 5.9	5221	5295	5981
North Louisiana	288	243	— 15.6	741,604	709,241	— 4.4	2548	2575	2919
South Louisiana	516	427	— 17.3	3,515,398	3,297,962	— 6.2	6899	6813	7724
Michigan	614	387	— 37.0	1,223,705	793,168	— 35.2	1987	1993	2050
Mississippi	94	86	— 8.5	475,577	418,268	— 22.1	5107	559	4864
Missouri	42	32	— 23.8	38,724	25,617	— 33.8	922	6545	801
Montana	78	98	+ 25.6	171,361	214,026	+ 24.9	2062	2197	2184
Nebraska	.....	41	.....	.....	91,815	.....	2221	.....	2239
New Mexico	358	168	— 53.1	1,153,168	468,390	— 59.4	3212	3221	2788
New York	503	391	— 22.3	638,668	539,624	— 15.5	1308	1270	1380
Ohio	422	787	+ 86.5	662,983	1,464,599	+ 120.9	1734	1571	1861
Oklahoma	1,062	1,009	— 5.0	2,529,323	2,564,967	+ 1.4	2788	2382	2542
Pennsylvania	1,939	1,893	— 2.4	3,343,369	3,301,113	— 1.3	1706	1724	1744
South Dakota	1	.....	.....	7,918	.....	.....	7918	7918	.....
Tennessee	15	7	— 53.3	17,250	11,414	— 33.8	1149	115	1631
Texas	5,087	4,741	— 6.8	19,000,496	17,301,943	— 8.9	3742	3735	3649
East Texas Field	143	317	+121.7	511,774	1,141,058	+ 123.0	3597	3579	3600
Rest of East Texas	128	267	+108.6	564,937	1,190,450	+ 110.7	4875	4414	4459
North Texas	1,113	1,143	+ 2.7	3,007,972	2,528,168	— 16.0	2603	2703	2212
South Texas	1,320	1,104	— 16.4	5,201,202	4,616,365	— 11.2	4003	3940	4182
Corpus Christi Area	624	587	— 5.9	3,430,512	3,222,999	— 6.0	5500	5498	5491
Laredo Area	569	398	— 30.1	1,516,573	1,174,185	— 22.6	2693	2665	2950
San Antonio Area	127	119	— 6.3	254,117	219,181	— 13.7	1926	2001	1842
Texas Gulf Coast	670	369	— 44.9	3,933,521	2,402,981	— 38.9	6074	5871	6512
Texas Panhandle	297	276	— 7.1	908,820	831,303	— 8.5	3054	3060	3012
West Texas	1,052	982	— 6.7	4,222,440	4,071,857	— 3.6	4071	4014	4147
West Central Texas	364	283	— 22.3	649,830	519,761	— 20.0	1829	1785	1837
Utah	1	.....	.....	5,643	.....	.....	5904	5643	.....
West Virginia	262	316	+ 20.6	676,708	811,650	+ 19.9	2530	2583	2569
Wyoming	67	54	— 19.4	216,633	149,375	— 31.0	3364	3233	2766
Total United States	15,007	14,425	— 3.9	43,658,934	43,246,211	— 0.9	3065	2909	2998

Income From Average Prorated Well Increased 25 Percent

AVERAGE daily revenue return from prorated wells have improved to such an extent since the first of this year that the industry's profit chances from new drilling investments on June 1 were much better than any time since January 1, 1938. The daily income from the 85,000 prorated wells has increased an average of $6.78 during the current year. Whereas the average income rate for prorated wells in the nation had declined to an all-time low of $27.72 daily on January 1, 1941, recently posted crude price advances and larger allowables have boosted this figure to $34.50 on June 1, this year, which represents a 25 percent improvement in "average profit probabilities" from prorated production.

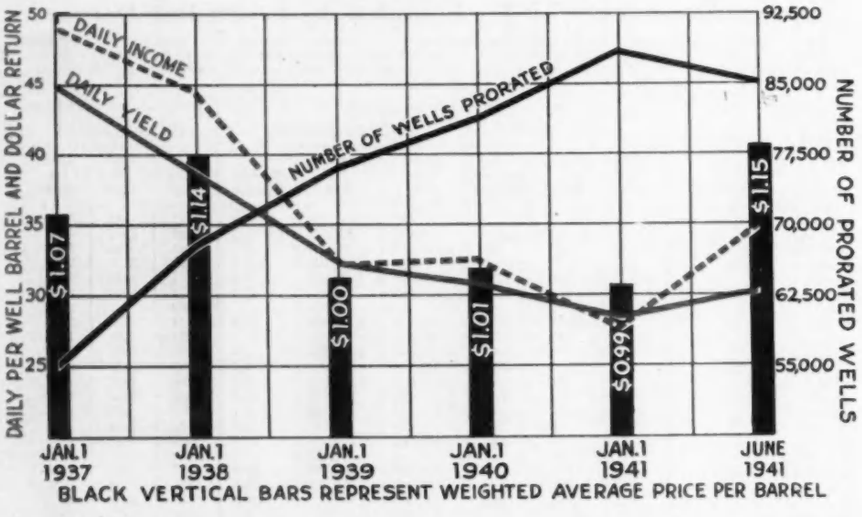
This is one of the most encouraging economic developments that could have taken place, for the steadily diminishing rate of revenue return in recent years, as a result of constantly shrinking per-well allowables and existence of depressed crude-oil prices, had reached the minimum level at which numerous wells could be operated without financial loss, and consequently the incentive to invest in the industry was being destroyed. If the trend had continued its downward tendencies, as it was indicated, oil operators would have been confronted with an extremely serious financial situation before 1941 had passed.

Thus one of the most perplexing economic trends facing the industry has not only been checked but has actually shown improvement. Were it not for the "emergency" shortage of tanker transportation facilities, the oil business could confidently look forward to an era of improved "average profit probabilities."

Every phase of the prorated well picture has improved during the five months preceding June 1, last. The average per-well allowable of prorated wells rose from 28 to 30 barrels daily, and contributed substantially to the improved revenue rates. For the first time since the inauguration of proration in the East Texas field in 1931, the number of prorated wells decreased; the 8 states practicing curtailment having 85,054 prorated wells on June 1, which represented a decline of 3920 from the all-time high of 88,974 that attained on January 1 this year, after a consistent rise from 56,508 prorated wells on January 1, 1937. This decline in number of prorated wells was the most important factor in the well-allowable increase, but was assisted somewhat by a 25,000-barrel gain in total prorated output. On June 1 this year, 2,522,328 barrels daily, or nearly 79 percent of United States crude production, was coming from prorated wells.

Most important contributing fac-

Combination of higher allowables and prices materially improved average prorated well income rates.



	Number of Prorated Wells						Daily Average Allowable Per Prorated Well					
	1937	1938	1939	1940	1941	1941	1937	1938	1939	1940	1941	1941
	Jan. 1	Jan. 1	Jan. 1	Jan. 1	Jan. 1	June 1	Jan. 1	Jan. 1	Jan. 1	Jan. 1	Jan. 1	June 1
Arkansas	*	68	181	271	364	378	*	211	136	154	129	132
California	7,250‡	7,940‡	8,220‡	8,666	8,984	9,122	70‡	74‡	63‡	58	53	53
Kansas	3,316	4,281	4,979	5,602	6,617	6,548	43	34	22	24	22	27
Louisiana	1,050§	1,271	1,492	1,984	2,652	2,906	200§	180	155	120	100	85
Michigan	*	*	*	517	97	96	*	*	*	111	145	145
New Mexico	1,285	1,890	2,356	2,860	2,404	2,366	71	56	42	42	37	41
Oklahoma	5,480	6,068	6,234	6,674	6,568	2,888	79	63	43	42	37	61
Texas	38,127	45,734	51,980	55,196	61,288	60,750‡	30	25	22	22	20	21
Total or Average†	56,508	67,252	75,442	81,770	88,974	85,054	45	39	32	31	28	30

* No proration in effect. § Estimated. † All averages are weighted on basis of production volumes.

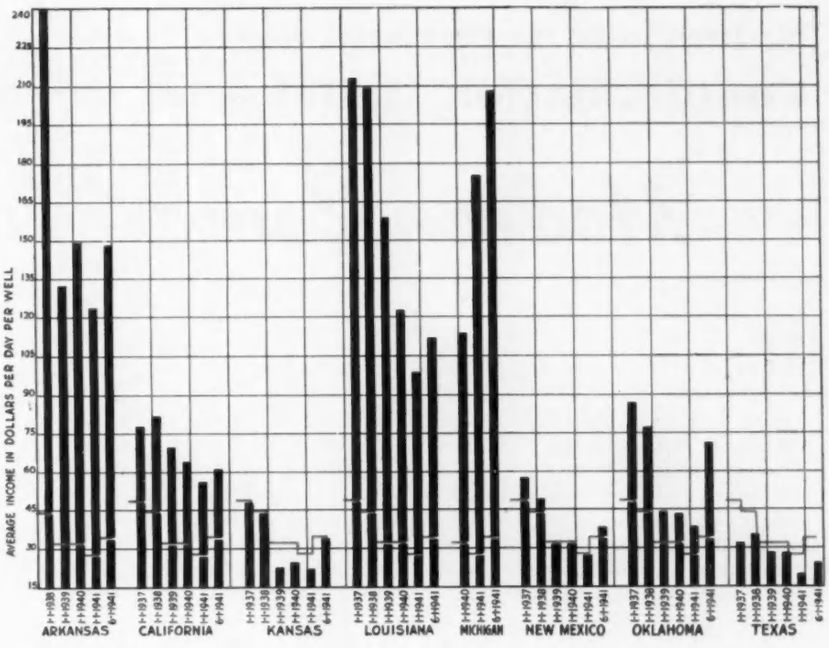
tor to the improved revenue rates, however, was the crude price advances posted since the first of the year. Average crude oil price per barrel on June 1 was $1.15, compared with a low of 99 cents on January 1, 1941.

State Conditions Vary

Different sets of conditions exist in each of the eight prorated states, but with exception all showed improvement in revenue returns between January 1 and June 1, 1941. However, all but one of the states with production curtailment programs registered raised daily average allowables, and it held to its same level. Five of the states reported fewer prorated wells, and all had better prices.

Texas, with 71 percent of the prorated wells and producer of only 50 percent of the prorated production, continued considerably below the national average income level, as its degree of improvement was materially beneath the national average gain. However, conditions in the state did show substantial betterment with income advancing to $24.15 daily from a low of $19.60 that existed on January 1 this year. The average daily production of the 60,750 prorated wells in this state, which represented a decrease of 538 wells, rose only from 20 to 21 barrels despite a boost of almost 70,000 barrels in allowable output. A 16-cent-per-barrel gain in crude prices, which advanced postings to an average of $1.15 a barrel, was mostly responsible for the state's $4.55 improvement in daily income rate. This was the lowest amount of increase in daily income among the states.

The greatest improvement in prorated well earnings occurred in Oklahoma, where the daily average income jumped close to 100 percent between January 1 and June 1 this year. Currently the prorated wells in this state average $71.37 per day, a gain of $33.63 over five months



Red lines indicate weighted average income all districts.

Despite improvement in Texas prorated well income trend, rates in this state continue below average of nation.

before. Oklahoma's advance was due to a drastic reduction in number of prorated wells, which permitted the average allowable daily output to increase from 37 to 61 barrels per day, and a 15-cent increase per barrel in average price. Prorated wells in the state declined from 6568 to 2888 on June 1. The current Oklahoma income is the highest since January 1, 1938, when crude oil was bringing 5 cents more a barrel than now.

Highest per-well incomes exist in Michigan, where lack of discoveries has permitted prorated wells to decline to 96 in contrast with 517 on January 1, 1940. The average daily output of Michigan wells is 145 barrels, which with an exceptionally high price gives a daily income of $208.80, a gain of $31.90.

Aside from Texas, California had the smallest margin of income increase. However, a gain of $6.36 in daily revenue rate left it with an income of $60.95. The number of prorated wells increased 138 in five months ending June 1, and the per-well average output remained the same, 53 barrels daily. The improvement in income, therefore, was due solely to the 12-cent boost in crude oil prices.

Kansas has the second lowest daily income rate, averaging $31.59 per prorated well, which was $9.15 better than on January 1, 1941. However, the daily average recovery gained 5 barrels per well, and the number of wells declined.

Despite a further decline in per-well production, from 100 to 85 barrels, Louisiana continues to rank high from an income standpoint. It has an average revenue of $112.00 per well, which is $14.00 higher than on January 1, 1941. An increase of 22 cents per barrel in average price was responsible for the improvement in this state.

Average Crude Oil Prices Per Barrel						Average Daily Income Rates Per Prorated Well						
1937	1938	1939	1940	1941	1941	1937	1938	1939	1940	1941	1941	
Jan. 1	Jan. 1	Jan. 1	Jan. 1	Jan. 1	June 1	Jan. 1	Jan. 1	Jan. 1	Jan. 1	Jan. 1	June 1	Gain
*	$1.14	$ .97	$ .97	$ .95	$1.12	*	$240.54	$131.92	$148.38	$122.55	$147.84	$25.29
$1.10	1.10	1.10	1.10	1.03	1.15	$77.00‡	81.40‡	69.30‡	63.80	54.59	60.95	6.36
1.10	1.22	1.02	1.02	1.02	1.17	47.30	41.48	22.44	24.48	22.44	31.59	9.15
1.06	1.16	1.02	1.02	.98	1.20	212.00§	208.80	158.10	122.40	98.00	112.00	14.00
*	*	*	1.02	1.22	1.44	*	*	*	113.22	176.90	208.80	31.90
.79	.88	.75	.75	.75	.92	56.88	49.28	31.50	31.50	27.75	37.72	9.97
1.10	1.22	1.02	1.02	1.02	1.17	86.90	76.86	43.86	42.84	37.74	71.37	33.63
1.06	1.15	.98	.98	.98	1.15	31.80	35.65	28.42	28.42	19.60	24.15	4.55
$1.07	$1.14	$1.00	$1.01	$0.99	$1.15	$48.15	$44.46	$32.00	$32.32	$27.72	$34.50	6.78

‡ California data not available for 1937, 1938 and 1939 as well records were not kept due to curtailment being on property or lease basis, so figures shown here are estimates based on percentages applying since June 1, 1939, when present curtailment program was adopted.

Selection Accuracy and Contamination Relief Goal of

Modern Completion Practices

MODERN well completion practices are being directed at securing full productive capacity of the bore hole exposure and increased yield of the well, careful selection of the producing section, proper conditioning of the hole prior to running the final pipe string, and location of possible upper productive zones for future testing.

Normal completion of wells for producing oil, gas or distillate follow much the basic steps which have been developed as deeper pays imposed greater burdens on materials used, and economics. However, in application of these steps, in the technique with which they are applied, well completion is becoming much more an exact operation. Basic completion data are checked and correlated before the final pipe string is run and the well given its initial production test.

Principal advances in obtaining basic data are in determining well depths accurately and logging them both statistically and graphically with measurements checked by both drill pipe and measuring device readings. Detailed determinations of the characteristics of formations penetrated permit accurate correlation with depths and insure proper location of completion equipment, such as packers, screens, perforations, liners and pumps.

Sealing off of undesirable formations and selective inclusion of desirable strata in the producing zone is an important phase of modern completion practices depending upon these accurate measurements and studies. These have enabled production to be procured from many thin sections that previously could not have been produced successfully. Advancements in cementing operations and advent of two types of chemical action, one selective in action and remaining semi-fluid in the presence of oil but hardening in water, and the other penetrating any formation and forming a permanent seal wherever placed, have improved selectivity of producing zones.

Tracing of upper or more elevated productive zones and their location for production at a later date are being expedited through closer check in logging during drilling, and through the placing of radio-active substances within such zones through perforator projectiles charged with "tell-tale" materials, so subsequent logging may be used to "rediscover" the zones even in case of loss or destruction of initial records or shifting of established bench-marks or other reference points.

Multiple-zone completions and progressive completions up the hole are being expedited and assured through running drillable or acid-soluble alloy sections in the completion strings opposite known producing strata, with perforating, wall scrapers, or nitro shots to open the sheath behind such sections and permit exploitation of the pay. Where steel casing has been placed opposite an upper zone, improved cutout tools are permitting economic removal.

In the proper conditioning of the producing sand face it is now considered advisable to remove the mud sheaths, and there have been many advancements in this direction. Included in these are acids for removing mud sheaths, new casing shoes that direct circulation fluid against the sand face, jet guns to scrub walls clear of mud, employment of scratchers or brushes mounted on the casing to break down the cake and permit its circulation out of the hole, and use of wall scrapers and underreamers to a larger extent. All these aid in securing full productive capacity of the bore hole exposure and increase yield of the wells.

There has been a growing use of gravel packing as a means of protecting screens against clogging, crushing or excessive cutting action. Gravel packing is applicable either through perforated casing, in conventional manner or by prepacked liners.

Basic Completion Data

Accurate measurements from surface to points within the well are perhaps the most important of all basic completion data. Use of drill pipe and sand line methods, although subject to human fallibility and mechanical failure, provide check on depths plumbed by wire lines, shot cables or other units which rely upon the revolution of a counter by the passage over it of a flexible medium.

That these measurements are considered of prime importance is evidenced by the continued research for better and even more accurate devices for measuring holes, especially in wells in the 10,000-foot and over class.

Greater accuracy in determining initial measurements, as to producing sands when several have been penetrated in drilling the well, enables more accurate completions to be made in multiple-zone work, and permits the plug-back work to higher strata to be effective in case of failure of the lowest formation to produce. Where thin sands are to be exploited at greater depths, check measurements of the drill string by stands while in the derrick, against the figures initially obtained by joint measurements, provide means for detecting initial errors.

In some instances checking and rechecking of the stands at each round trip when near the expected pay has been found to more than justify the extra time thus consumed in the additional accuracy of spotting optimum penetration points.

Discussing the value of basic completion data, S. F. Bowlby[1] concludes that "the graphic recording of completion data is of growing importance" and that consideration should be directed more and more toward adding to the

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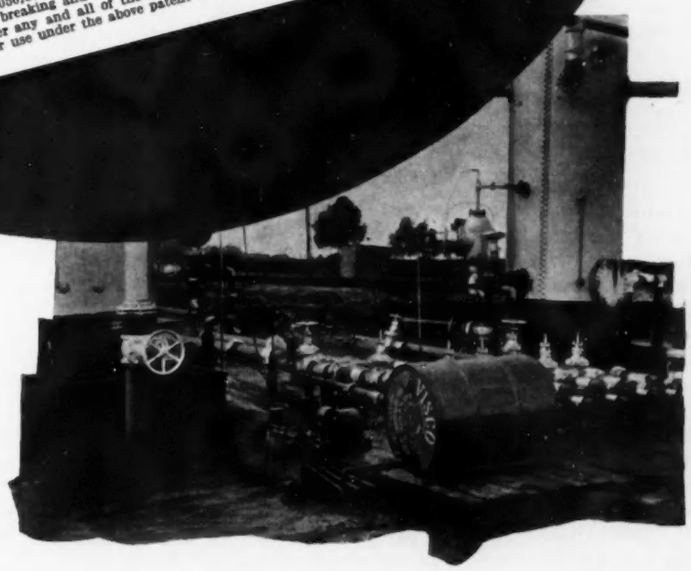

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initial unification of such data in standardized procedures. Graphic records, such as obtained by recording instruments, electrical logs, shooting logs in gun-perforated wells, and plotted values from core analyses, afford and are being relied upon more and more as background against which the actual mechanical measurements of well depths may be plotted and more nearly perfect completions effected.

Progress in core analysis in field laboratories, which have the advantage of receiving the cores while fresh and as close to actual strata conditions as possible, as well as through determinations made at a distance on sealed samples, afford much more accurate data on the amounts of connate water, oil and gas, and such factors as porosity and permeability than were formerly obtainable through derrick-floor methods enabling completion to be made at a point where most favorable factors combine to give greatest promise of production.

Field core-analysis laboratories, truck-mounted, are now standardized on methods and can give sample determinations within a short time after the core is brought to the surface.

A means of marking thin productive strata, logged during drilling of a well, for reference and possible perforation for production at some later time, recently has been developed which will permit the pick-up of the pay regardless of any disturbance of basic bench marks at or around the well head. Bullets, containing relatively small amounts of radio-active materials, are fired into the zones which are to be passed up in the first casing program, and then later spotted exactly by means of a measuring line which carries a receiver sensitized to the emanations from the "tracer" bullets.

A very recent development in obtaining basic completion is the use of electrical recording calipers that measure the diameter of the hole. So far as completion of wells are concerned, such data serve as an additional geological check on formations and as a means for locating proper seats for packers, liners, etc.; it having been found that hole diameters generally are larger in shale formations than in sand zones.

Through careful location, measurement and study of formations that are permitted by various modern practices and available means, producing zone selectivity has become a highly important and regular practice with the industry. Not only is it possible to locate and complete in a very small section, but it also is possible to shutoff gas or water-bearing sections of a formation with accuracy.

Gas- or water-bearing sections surrounding an oil-bearing horizon are sealed off by accurate placing of perforations, cementing, or some of the new chemical plugs.

Cleaning Sand Faces

Particular attention is being devoted to the cleaning of sand faces, so no obstructions will be left to retard flow into the well bore. Several means of accomplishing this work have been developed and used successfully. In addition to the regular type wall scraper in use for many years, means of cleaning sand faces range from chemical, hydraulic-jet action to straight mechanical methods.

Substances which effectively reduce production in a new well may be water, mud, or cake formed through pressure hydration of drilling mud. It is recognized that mud from drilling fluids and other foreign matter, if left encasing the producing formation, may either wall off the formation to such extent that oil or gas production flow into the well is hampered, or seal off the outside of screen, slotted liner or perforations to restrict flow, or to cause the flow to enter through a few small openings with their subsequent cutting out until no longer serviceable.

The primary purpose of hydraulic jetting devices in use is to allow a high-velocity fluid stream to be directed against the pay formation during completion work in order to clean away all possible mud and silt resulting from the drilling operations. Equipment on the market for this purpose range from special drilling bits to newly designed casing shoes and jet guns.

In using mud acid to clean the well-bore face, the treating fluid compound differs in a number of respects from a normal treatment. It contains surface-tension-reducing agents to allow great penetration and subsequent reduction of filter cake which might have been formed. Following the treatment, it is usually desirable to wash down the formation with a non-emulsifying acid solution which mechanically removes, dislodges and suspends insoluble particles of foreign matter. Some treatments have been successful with no more than 250 gallons of mud acid, but others have required 2000 gallons. In addition to being used to remove mud sheaths directly from the sand face, mud acid also is being used to remove silt from behind the screen or liner.

Among the new mechanical means for removing mud sheaths from the producing zone are collar scratchers having wire fingers that are placed on the casing at intervals. Vertical movement of the casing furnishes abrading action which loosens the filter cake and permits it to be circulated out of the hole. In addition these devices also center the casing string in the hole.

Relieving Contamination

Leading oil producers and mud engineers are conducting extensive research to develop fluids and other items that will retard filtration into permeable formations, and some definite improvements in this respect have been achieved.

Oil-base muds[2] have been used, outstanding advantages of which are said to be:

1. Minimize the possibility of impairing the natural flow potentialities of the producing horizon such as that resulting from infiltration of water from water-base muds.
2. Permit smaller clearances for setting liners, since the mud sheath has no appreciable thickness.
3. Eliminate the possibility of clogging the perforations of the liner with thick mud sheath.
4. Facilitate the removal of the mud sheath from the walls of the hole, for its mud sheath has no appreciable strength.
5. Assist in drilling through formations such as heaving shale where water wetting appears to be a source of difficulty.
6. Permit cores to be drilled and obtained without contamination from drilling water.

Another contribution toward relieving formation contamination has been the use of soluble cements, which can be removed with acid solutions. This cement is made by mixing approximately equal parts of ordinary oil well or Portland cement with specially prepared calcium carbonate.

Successful completion in low-permeability formations, such as the Austin chalk horizon of Southwest Texas, have demonstrated benefits from use of oil as a circu-

[*Continued on page 112*]

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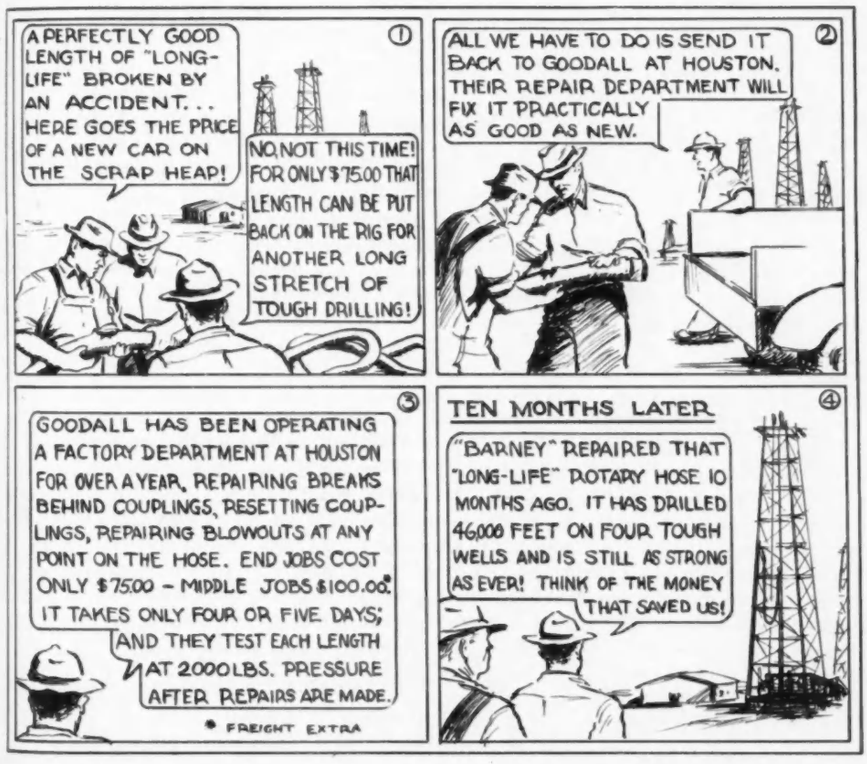
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War Takes a Hand in Foreign Drilling

By J. V. HIGHTOWER, Foreign Editor

MOST oil-producing regions outside the United States have been variously affected by the war in the first half of 1941. Areas such as the Near East have suffered from fighting and disruption of normal export channels. Canada and South American exporting nations have benefited by recently increased demands from the British forces, whereas Mexico, bereft of former outlets and lacking tankers, finds little encouragement for new development. In some regions, such as the Far and Near East and the European continent, information on drilling progress continues blacked out by censorship.

Canada Forges Ahead

In Canada, production and drilling forge ahead beneath the whip of Britain's war-time needs. This year through April the country's crude output was 3,200,000 barrels, a third more than in the same period of 1940. Last March the government announced a seven-point program to encourage exploration and development of new and proved areas.

A new region developed this year and getting considerable play is the Princess field, opened when Standard Oil Company of British Columbia's Princess 2, 130 miles east of Calgary, was completed early in January for 520 barrels daily from 3260 feet. Through April the field had five new rigs.

In Alberta province, where 95 percent of the country's oil is produced, the drilling record by fields, through April, was as follows: Turner Valley, 14 new rigs, 10 completions and no abandonments; Princess, 5 new rigs, 1 completion and 1 abandonment; Vermilion, 1 new rig, 2 completions and no abandonments; other fields, 1 new rig, 2 completions and 1 abandonment.

Although long known as a source of heavy oil, the Athabaskan oil sands of northern Alberta have only recently come into commercial production. Abasand Oils, Ltd., has built within a few miles of Fort McMurray a plant designed to process 400 tons of oil sand daily and yield about 350 barrels of gasoline, diesel and residual fuel. A 29 percent yield of 400 end-point gasoline of high octane number is expected. Development of the plant opens up a petroleum source in a deposit estimated to range between 10,000 and 30,000 square miles in area.

Canada will have a new pipe line this year when Standard Oil Company (New Jersey) completes late in the year its 12-inch, 240-mile, 50,000-barrel-per-day crude line between Montreal and Portland, Maine. Completion of the line will insure deliveries of oil to Montreal's refineries throughout the year. The line will take South American and perhaps Gulf Coast crudes from tankers at Portland.

Mexico Not Profiting

Mexico's oil industry is not profiting from the war, which has shut off exports to Germany and Italy and which has cut into available tanker capacity. From January through April the country's crude production was 11,800,000 barrels as against about 13,000,000 barrels in the same period last year. Exports dropped by 24 percent. Drilling outside the proved fields appears to be desultory. Early in the year in these fields the government oil company had two wells drilling in the Northern district, three in Poza Rica and four in the Isthmus. Explorations are planned for the Pacific Coast, and a test has been located in northern Mexico west of Reynosa.

For a while last March there was a chance that the Mexican oil industry would again seek badly needed foreign capital and skill when President Camacho submitted to congress amendments that would have allowed foreign companies again to enter on condition the government held a controlling percentage of their stock. The lower house, however, struck out this proposal. Since then, periodic rumors of some sort of settlement with the expropriated companies have cropped up and died. Meanwhile, the government oil company continues to struggle along with a heavy accumulated deficit and meets with obstacles to needed internal changes.

Venezuela Helped

Drilling and production in Venezuela have been encouraged by recovery of exports from the slump of last year. Total production of crude in April was about 17,000,000 barrels, a gain of 11 percent over January production and the highest output since spring of 1940.

Several new fields in the eastern region have been discovered this year. Mene Grande Oil Company's Santa Rosa field, 11 miles northeast of El Roble field, opened in January with completion of Santa Rosa 2 at 6535-6550 feet for about 2000 barrels daily. Two additional wells are drilling. Production of the field has averaged over 20,000 barrels monthly. Last February, Venezuelan Petroleum Company's (Sinclair) Santa Barbara 1, in district of Maturin, state of Monagas, established the Santa Barbara field with an initial daily production of 4000 barrels from around 4300 feet. Subsequent production, held in, has been about 3000 barrels monthly. A second well a mile north of No. 1 was spudded during May. A third field was indicated when Standard Oil Company of Venezuela brought in Las Ollas 1, 40 miles southwest of El Roble field, for a reported daily production of several hundred barrels.

Wildcatting, which featured Eastern Venezuela operations last year, has continued into this spring. Socony-Vacuum Oil Company's Panchita 1, 43 miles southwest of Oficina field, was abandoned in April at 3606 feet. Rig was moved to a new location, Hamaca 1, 11 miles northeast of Atapirire in southwestern Anzoategui, is drilling below 3400 feet. Another Socony-Vacuum test, Anaco 1, 4 miles northeast of El

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1 **Patented Self-Feeding Ram Packing Element Makes Positive Shut-off, and Permits Pipe Movement Under Pressure**—This tough, steel-reinforced block of special formula rubber (or Neoprene if specified) represents the longest forward step in blowout prevention devised in a decade. It is designed so that when rams are closed rubber is forced to flow to the pipe where it makes a pressure-tight seal. The rubber is completely enclosed by steel and therefore cannot be blown out. Each packing element contains many cubic inches of rubber in reserve which, as needed, is automatically fed out to the pipe. This simple but extremely positive ram packing gives drilling crews complete confidence in their ability to shut in the worst blowout.

2 **Rotate and Spud Through Closed Preventer Rams**—So positive is the seal effected by Cameron Self-Feeding Ram Packing Elements, and so great is the reserve of packing material in each element, that drill pipe may be rotated continuously and raised and lowered through the closed rams for hours with complete safety while circulating to regain control of a well. This is the best possible guarantee against stuck drilling strings and among ram type preventers, is exclusive with Cameron units.

3 **Rams Opened and Closed by Fluid Pressure**—Opening and closing of Cameron Blowout Preventers and Gate Valves is accomplished instantly by fluid pressure—provided by boiler feed pumps or by slush pumps. Thrust is directed against the longitudinal axis of the ram—not against the side of the ram through auxiliary thrust transmission devices. It has been proven that only this type of ram control is fast, absolutely positive, and thoroughly dependable.

4 **Fast Ram Closure Keeps Mud in Hole**—An outstanding advantage of high-speed, fluid pressure ram closing is that the weighted mud column is kept in the hole to assist in controlling "kicking" well pressure.

5 **Operated Through an Enclosed Fluid Pressure System**—The fluid pressure for opening and closing the rams is delivered through an enclosed fluid pressure system. High gas pressure blowing up under derrick floor cannot affect or prevent instant ram closing in an emergency. Independent ram closing and locking screws are provided to lock rams in closed position, or to close rams manually in event pressure is not available. No other preventer of any type has both of these features.

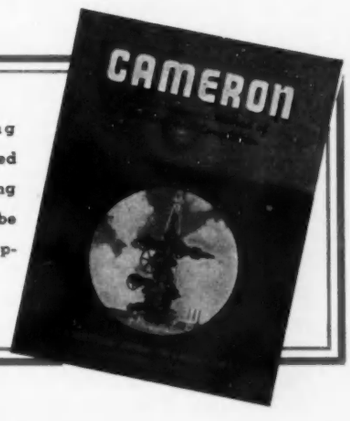
6 **Four-to-One Holding Ratio Provided**—Cameron Ram Closing Pistons provide a holding ratio ranging from three-to-one to four-to-one, depending on size. For instance, 500 pounds closing pressure enables a Type SDA Preventer to hold 1500 to 2000 pounds well pressure without application of the ram closing screws, as long as closing pressure is applied.

7 **Remote Control Eliminates Danger to Drilling Crew**—Cameron Blowout Preventers and Gate Valves are controlled by a 4-way control valve which may be installed at any desired point for quick, convenient, safe operation by a member of the drilling crew. Compare this safe, high-speed remote control with the relatively hazardous, slow and exposed operation of closing a manual preventer from the edge of the derrick floor by means of extension wrenches. Safe, fast remote control inspires drilling crews with highest confidence and morale in event of a blowout.

8 **Rams Automatically Center Pipe in Hole**—Due to derricks being out of plumb, or rotaries being out of position, drilling strings almost invariably hang off center in the well bore. For this reason, Type SDA Preventers are equipped with Self-Centering Rams. As the rams close, heavy wing guides in opposing rams contact pipe in hole—if it is hanging off vertical—and force pipe to center of hole, and center of rams. The wing guides, unlike those provided on other types of preventer rams, are extremely heavy and cannot be bent, thus insuring against "fouling" the rams and preventing complete closure.

9 **Cuttings Cannot Accumulate to Prevent Full Ram Closure**—Due to the round ram bore of Cameron Type SDA Preventers, no shelves are left where cuttings can settle and pack, and thus prevent full ram closure in an emergency.

A copy of this interesting brochure — "Cameron Closed Pressure Method of Drilling and Completion" — will be gladly sent to interested operators on request.



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Roble field, was coring shale below 10,990 feet late last month. In the Santa Ana region, The Texas Company of Venezuela's Rincon Largo 1 last April flowed, after perforating, at the rate of 385 barrels daily through 3/16-inch choke from the 8775-8790-foot level. Total depth is below 9630 feet with further tests under way. Derrick for a second nearby test is erected. In central Guarico state last May, Sociedad Anonima Petrolera Las Mercedes, affiliate of The Texas Company, suspended drilling at 6232 feet in Mercedes 1. At a point 10 miles east of the Mene Grande pipe line and 32 miles north of El Roble field, Mene Grande Oil Company was perforating Quiamare 1 at 5900 feet in June. Early this year Standard Oil Company of Venezuela abandoned a dry hole near Socororo, 20 miles west of Oficina field and suspended operations in that vicinity.

In Western Venezuela there is a marked picking up in drilling activity.

A pipe line possibility for this year is a line from Venezuelan Petroleum Company's Santa Barbara field to a terminal on the Caribbean in the Puerta la Cruz region. Although it is declared no decision to build the line has been reached, the route apparently would run from the field westward to the Mene Grande pipe line and then parallel to this line to the Caribbean. The project awaits further testing of the new field. Reports have been current that a western Venezuela subsidiary of Standard Oil Company (New Jersey) has planned a 24-inch pipe line from a point in the Lake fields to the Caribbean, but company officials have declared such reports to be unfounded.

Colombia Exports Up

The Colombian oil industry is enjoying increased exports because of heavier shipments into British consumption. In May, 1,832,000 barrels left Mamonal terminal, the largest volume in recent months. The De Mares concession continues to provide the bulk of Colombian oil, averaging over 55,000 barrels daily as against 10,000 barrels from the Barco. In April the De Mares concession had three rigs operating and one new well. La Cira field is yielding about 80 percent of the total production, Infantas providing the remainder. Tropical Oil Company faces the possibility of losing to the government its De Mares concession on June 14, 1946. The government has filed suit in the Colombian supreme court to obtain a decree fixing that as the expiration date of the concession, but the company contends expiration occurs August 25, 1951. The controversy arose over a difference of opinion as to the date on which exploitation formally began.

On the Barco concession, Colombian Petroleum Company continues active wildcatting despite the recent heavy writedown of the property's value. Late last month the company was below 8900 feet in Socuavo 1, and location had been made for No. 2 nearby. South Sardinata 1 was drilling sand and shale at below 3150 feet. Location was established for a new test, North Sardinata 1. Strong prospects were that drilling would be suspended in Tres Bocas 2, which is around 2000 feet.

Some exploratory wells are drilling in the Magdalena River valley. Late last month, Shell Oil Company of Colombia in contract with El Condor Petroleum Company was drilling below 6400 feet in Casabe 1 on the west bank of the river near Tropical Oil Company's refinery at Barranca Bermeja. On Socony-Vacuum Oil Company's 33,000-hectare concession on the west bank, Magdalena River Valley Petroleum Company was about to set casing at 1494 feet in Cimitarra 1, fronting the river opposite Puerto Wilches. Tropical Oil Company's Cimitarra 1 on the Gutierrez concession just north of the Shell test is down about 4700 feet. Richmond Petroleum Company expects this year to spud a well 9 miles northwest of San Pablo on its concession on the west river bank, and is constructing a camp. Richmond's program calls for several wells.

Three new oil companies, each capitalized at 1,000,000 pesos, were formed in Colombia last month. Standard Oil Company of California is reported interested in these companies, named Compania de Petroleo el Meta, Compania de Petroleo Gran Colombia and Compania Colombiana de Petroleo Sierra Nevada. In May the government granted concessions of 56,500, 122,000 and 39,000 acres to L. A. Villamizar, Martin Theves and Francisco Laserna, respectively.

Argentina Output Up

Argentina, by increasing the output from known fields, raised its crude production in the 1941 first quarter by 10 percent over the same period last year. Mendoza production accounted largely for the gain. Output by the private companies continues to drop. Government figures show that last year, private production was 40 percent of the total, whereas in the first quarter of 1941 this percentage had dropped to 36.

An undisclosed amount of drilling has occurred this year to determine the area of the new field discovered in 1940 about 20 miles south of El Tordillo Oriental. The Argentine Yacimientos Petroliferos Fiscales was drilling a well last month at San Cristobal with no shows reported, and was also drilling tests in the northern and northeastern districts of Santa Fe province. In the fields of Comodoro Rivadavia, Plaza Huincul, Salta and Mendoza Y.P.F. early this year was drilling 28, 6, 7 and 9 wells respectively. At widely scattered points, Ultramar Sociedad Anonima Petrolera Argentina has drilled three wildcats. One, Piedra Clavada 1, about 130 miles west of San Julian and in Santa Cruz province, was below 3800 feet last month. The second, Saladillo 2, 25 miles east of the city of Jujuy in Jujuy province, recently suspended at 4405 feet with no shows. The third, Cerro Lumbreras 1, in Salta province and about 50 miles southeast of Salta, suspended at 1061 feet.

Argentina is not yet self-sufficient in petroleum products but is moving in that direction. Early this year two new government refineries began operations, one at Lujan de Cuyo with a daily capacity of 3150 barrels and the other at Salta with a capacity of 2000 barrels daily. Construction of a 550-mile pipe line from Mendoza province to a government refinery at San Lorenzo on the Parana river has not yet begun, but information last month was that United States equipment companies were still hoping to obtain contracts for the project. The American pipe mill situation does not portend early construction of this line.

Bolivia, with the market for fuel oil greatly increased, is hampered by lack of funds. In a recent issue of The Oil Weekly will be found a special article on Bolivia, involving an interview with the new president of the Yacimientos Petroliferos Fiscales Bolivanos, government oil company in Bolivia, which is trying to increase its production.

Russia and the East

As usual, little is known of specific drilling programs and discoveries in Russia. However, the fact that the government oil companies continue to be under fire because of wasteful practices, and the fact that great

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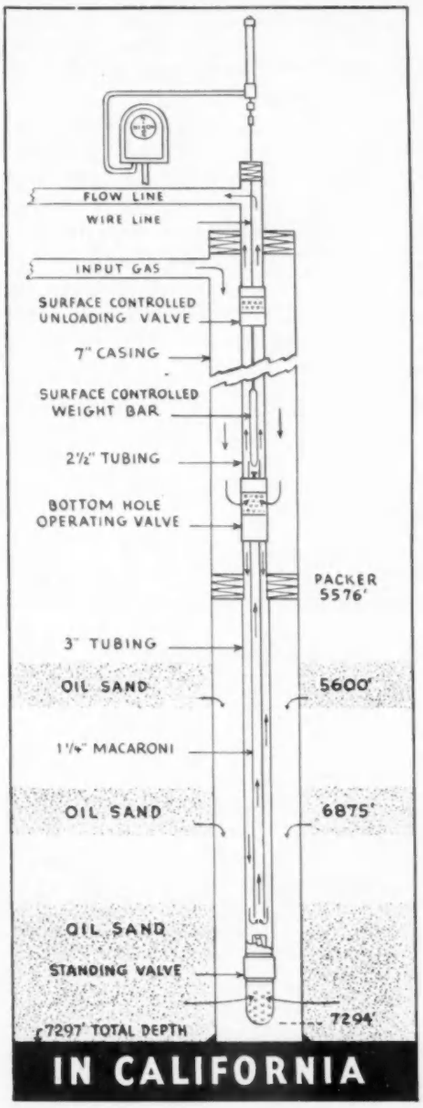

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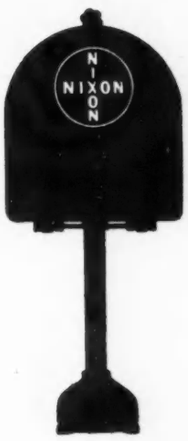

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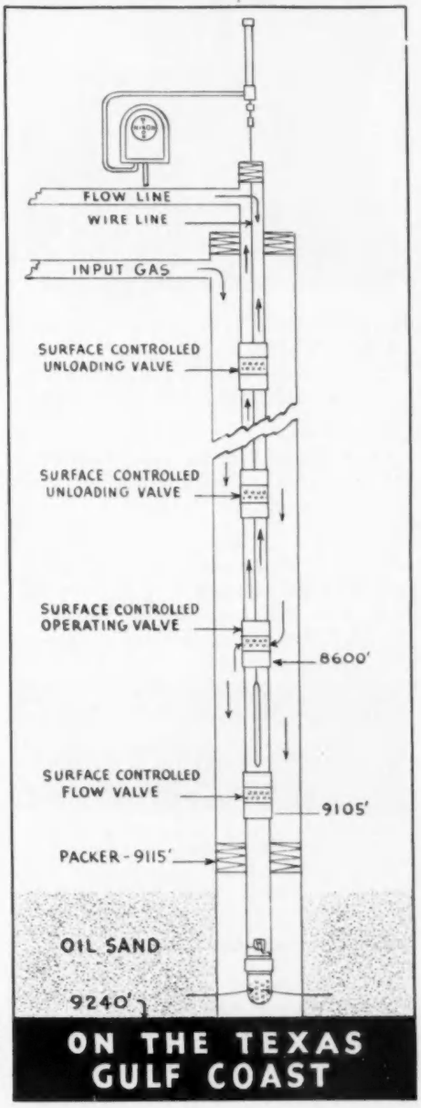

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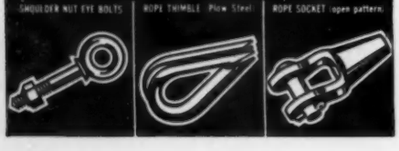

quantities of field equipment to replace obsolete machinery are sought, indicate that Russia's immediate objective is more efficient use of proved fields. Production of oil in 1940 was 20 percent under that scheduled for the year. Now that the country's already inadequately producing fields are called upon in the fight against Germany, a prompt increase in production is imperative. New drilling in proved areas and maximum production of existant wells without regard to ultimate consequences are likely to be resorted to rather than expenditure of equipment to discover new fields.

Operations in the Near East this year are shrouded in uncertainty. Combined crude production of Bahrein, Iran, Iraq and Saudi Arabia for the first four months was only 83 percent of what it was in the same period last year, a drop traceable almost entirely to a 60-percent decline in Iraq production. With the fall of France, Kirkuk crude ceased to be pumped to Tripoli. Discontinuance of normal exports to Great Britain, and the Iraq rebellion, further hampered production in Iraq. Well-based information indicates that exploratory drilling in that country has ceased for an indefinite period. Production in Bahrein and Saudi Arabia this year has been about as it was in the comparable period of last year. Detailed data on recent operations have not been released. It may be inferred from the annual report of Standard Oil Company of California this spring that the outlook for Saudi Arabia continues promising. The report briefly declared that results from exploration and development there in 1940 were "very satisfactory."

Little is known of operations in the Far East. Production of Netherlands East Indies, through April, was about as it had been a year ago. The British base at Singapore is taking large quantities of refined products from refineries of the area, and Japan has sought with not a great deal of success to increase imports of East Indian oil.

Completion Practices

[*Continued from page 102*]

lating medium. The hole is cleared of all mud and water, and oil is used as the circulating fluid during completion work. With the entire system filled with oil under pressure, drilling into the formation proceeds as with normal mud circulation. In the Austin chalk the wells are acidized following this operation.

Compressor-Swabbing Method

At least one California operator has been using a low-volume, high-pressure portable compressor to clean up and bring wells into production. By forcing mud, water, dead oil and emulsions from the casing annulus and tubing string, live oil and gas is allowed to enter the well bore from the formation, causing the well to flow. Wells in the area where this is being used usually penetrate at least three zones.

Slim Hole Completion

Shell Oil Company during the past year has been completing wells in the Ten Sections field of California by use of 4½-inch "drill casing." Following drilling of the well, the drill string, to which has been added some 200 feet of perforated pipe of the same size, is run into the hole and cemented in place as the oil string. To effect still further economies in both time and equipment, the two-inch tubing flow string is fitted with a special bit adapter and used to drill out the cement plug, after which the string is allowed to remain in the hole until the well is pulled at some later date. The bit is equipped with holes of slightly larger than normal size, permitting production to enter the string without noticeable restriction. Several round trips are saved during the last stages of drilling; there are no stands to drill pipe to be broken down and moved to the next location; and a speeding up of operations is made possible through use of but six instead of eight lines through the blocks.

BIBLIOGRAPHY

[1] S. F. Bowlby, "Well Completion Data," API Drilling and Production Practice, 1939, page 26.
[2] H. W. Hindry, "Characteristics and Applications of Oil Base Mud," Petroleum Technology, May, 1941.

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United States Sustains

High Discovery Rate

WILDCAT activity provided about 130 new United States fields during the first six months of 1941, a negligible drop from the 135 opened during the corresponding period a year ago. Older fields gained more than 100 new pay horizons, comparing favorably with the 215 opened during the full year 1940.

On this basis, it would seem that new field strikes for the year 1941 should total in the vicinity of 250, unless wildcat activity should be curtailed during the balance of the year because of the possible shortage of pipe and other supplies due to the great steel demand created by the national defense program.

On the other hand, the desire of both government and industry to maintain crude reserves at high levels, may mean an increase in wildcatting. Such a course naturally would be expected to boost field discovery rates.

Texas continued to lead all regions in discoveries.

North Texas Outlook Improves

Fourteen new producing areas and proving of 13 new oil levels in established pools and fields materially brightened the outlook for North Texas. These strikes are distributed among nine counties, and exceed the volume recorded for the first half of 1940. Followup development has not progressed sufficiently to ascertain their importance from the standpoint of productive area and crude reserves. It is of interest to note that the majority of the strikes are producing from deep lime and sand zones in line with the district's trend towards deep production as its shallow prospects become fewer.

The Mississippian lime forged ahead as a promising source of high-gravity production. This zone accounted for a small well in north central Archer County and two Young County areas scored their first producers from the Mississippian through deep prospecting. They caused a major lease buying campaign in the northwest quarter of the county. Clay County's initial Mississippian strike logged a 150-foot broken pay section to become the outstanding discovery from this sparsely explored horizon. Also proved was the Antelope pool, southwestern Clay County, for a prolific flow from the Mississippian.

Production from Ellenberger dolomite made its initial appearance in the old Electra field through deepening a shallow stripper well. It is expected to be the forerunner of a series of local deep pools within the expansive shallow field. Production from both Bend and Ellenberger was uncovered by the initial deep test in the abandoned portion of the Worsham field, eastern Clay County. This horizon was proved in the Bindel pool, western Clay County, after the area was opened with a Strawn strike earlier in the year. Ellenberger production that underlies the southwest portion of the KMA field was expanded to between 2400 and 3000 acres as result of an active development program being launched early in the year in all directions from the 1940 discovery.

Bend Important High-Gravity Source

Bend lime continues to gain in importance as a source of high-gravity oil. Discoveries were made in Young County, Jack County registered a gasser, and an oil pool was uncovered in Throckmorton County. In Clay County, the Bend was proved for oil production near the abandoned Neb-Tex wildcat producer from the Strawn.

A new pool was opened in Montague County from lime tentatively identified as the Marble Falls, which has not produced heretofore in the county.

The Strawn sands failed to come through with their normal volume of strikes. Two new zones were proved in the Harrold pool, Wilbarger County, and attractive oil production was uncovered from this zone in the Sewell deep pool, Young County. A new Strawn pool with small initial was opened in Jack County, while a new Strawn oil level was to the Benton-Holmes pool, Montague County. The Burns-Browning pool, Clay County, was extended northwest with a flowing well in the upper Strawn.

West Texas Strikes Lag

West Texas failed to come through with its normal quota of discoveries during the first half of 1941, but this was offset by major extensions given numerous fields to assure continued active development. The district has displaced South Texas in leadership on monthly volume of new producers, and has ample undrilled proved locations to maintain its current drilling activity beyond 1941.

Discoveries include a small Ellenberger oil producer in Pecos County, and a shallow oil well on the southeast flank of the Todd structure, Crockett County. Undetermined classification strikes involve a prolific Ellenberger oil producer four miles south of production from the same zone in the Sand Hills field, and a test three miles northeast of the Waples-Platter pool, Yoakum County. The latter has been officially designated as a new pool, although the Permian markers are level with nearest production. In northern Ector County oil production was scored that is apparently related to a

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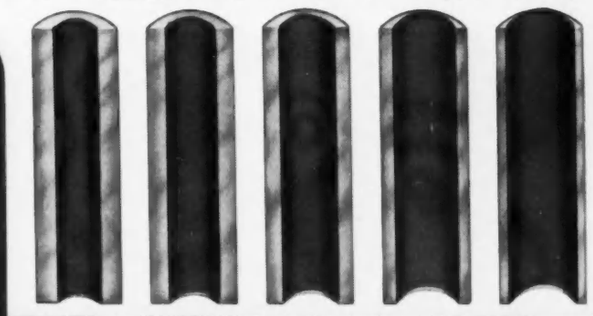

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gasser on the Embar prospect, Andrews County.

A series of extensions given the Slaughter field enabled it to be the largest contributor of proved acreage, and it also became the most active drilling center in the district, replacing the Wasson field. Major extensions occurred in the Foster and Goldsmith fields, Ector County; northeast sector of the Sand Hills field, Crane County, and the Abell deep area, Pecos County. The latter also added a new oil zone in the lower Simpson.

Deeper oil zones were recorded by the Pecos Valley field, Pecos County, and the North Goldsmith field. However, the initial completions were not as large as the wells in the regular producing levels. The latter enhances the prospects for deeper production in the original Goldsmith field.

East Texas Wildcatting Up

There was a substantial gain in wildcat operations in East Texas basin, largely due to discovery of the prolific Hawkins dome late in 1940. It will continue through remainder of year with greater number of tests projected to Lower Trinity. The district's single discovery involves a small oil producer with high gas-oil ratio on New Salem Woodbine prospect, southwestern Rusk County. Previous failures indicate the producing area is somewhat narrow.

Development of Hawkins dome is carried out on an orderly basis, and volume of completions is exceeded only by East Texas field. Productive limits of Hawkins is virtually defined by failures and structurally low producers. However, uninterrupted drilling is assured through 1942. Drilling within the East Texas field is expected to be ruled as nonessential by the federal coordinator.

Discovery of oil production on the west flank of the Willow Springs deep gas-distillate field, Gregg County, and pending installation of initial recycling plant will stimulate drilling in this 7200-foot Pettit lime area.

Extension of the Long Lake Woodbine area 6500 feet northeast with an above-average oil producer will enable the field to remain an active drilling center beyond 1941. The deep Chapel Hill oil and gas-distillate field, Smith County, has the greatest number proved undrilled locations, but development is being curtailed for economic reasons.

West Texas Has 3 in 1 County

Three oil discoveries in southern Jones County, and the addition of new oil horizons in three other pools in the county stimulated development. These new strikes have not been explored sufficiently to determine their importance.

Callahan County contributed a new shallow pool, and new gas areas were uncovered in Coleman, Palo Pinto and Brown counties. The Brownwood shallow gas pool, oldest in the district, recorded an oil strike in deeper pay that is being given follow-up development. A dearth of shallow discoveries in Shackelford County is reflected by a sharp drop in drilling activity which set the pace for the district in recent years. Drilling in Eastland, Stephens and Palo Pinto counties, where numerous pools and fields are on production, is also subnormal.

Panhandle Activity to Increase

Texas Panhandle lagged behind in drilling the first six months of 1940, but due to insufficient crude supply for local refineries an aggressive development program has

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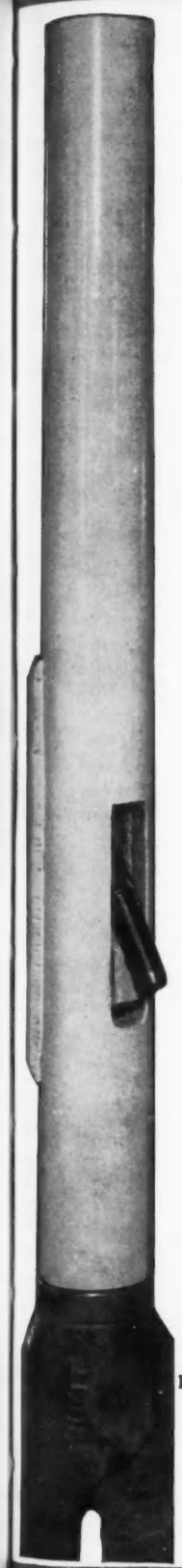

Fig. 1

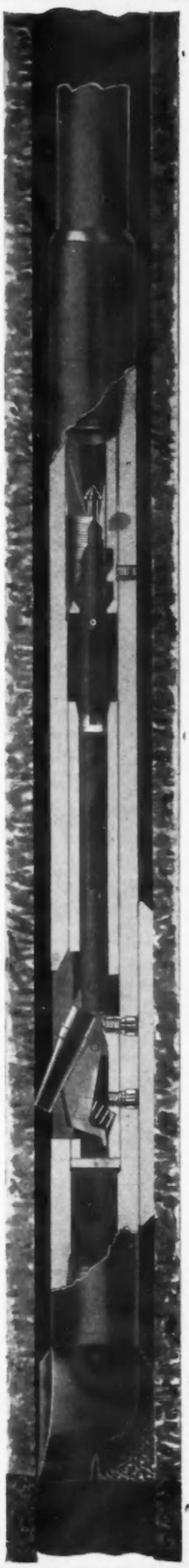

Fig. 2

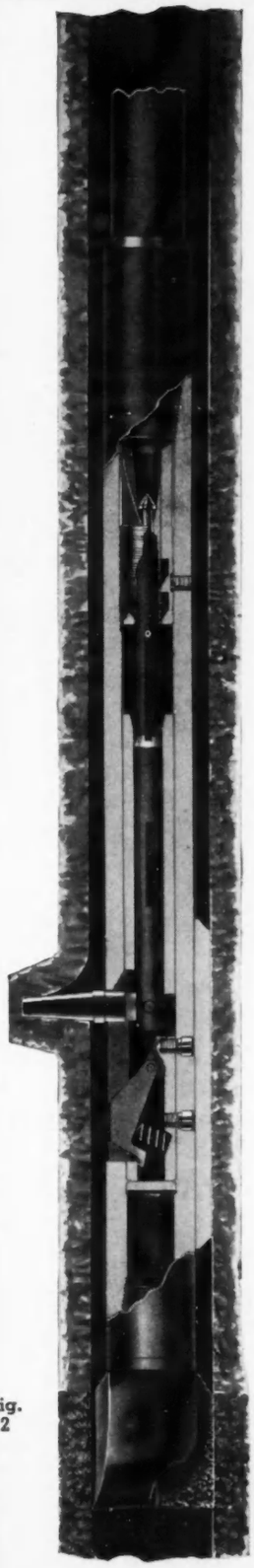

Fig. 3

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1. **Showing the tool, with wire line retractable barrel in position to receive the core.**
2. **Core tube deflected, ready to penetrate side wall to take core.**
3. **Core tube in side wall after lowering of drill pipe has caused penetration. Drill pipe is now slightly raised, and core recovered by wire line.**

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been scheduled for the last half of the year. Wildcatting has been restricted to comparatively few tests. Large-scale lease blocking in the northeast sector of the district, embracing the west extension of the Anadarko basin, occurred early in the year. This is a preliminary step towards deep prospecting below the Permian beds.

Texas Gulf Coast Gets Twelve

Exploration work, geophysical activity and drilling has been steady on the Texas Gulf Coast, but was not as heavy as had been expected. Unusually heavy rainfall throughout the area kept geophysical work down, with a consequent decrease in number of acreage transactions and discovery of favorable prospects for drilling. There have been 12 new fields discovered, with no particular trend outstanding. Three new fields are producing from the Wilcox, four from Cockfield-Yegua, four from Frio and one from Miocene.

What may be the most important field of the period was opened in Montgomery County at Lake Creek, where a Wilcox-sand discovery well was completed just below 9200 feet. The second test extended the field ¾-mile west, and ran almost level with the discovery on the upper sand but was completed in a new sand 500 feet deeper, with four other sands in between that were not tested. The West Garwood field, Colorado County, was opened with a Wilcox well, but a second test has not drilled to the deep pay. Cockfield production was opened in the same area, with three wells completed in this upper sand, and two tests drilling. A discovery at Vienna, eastern Lavaca County, and southwest of Sheridan field, provided another Wilcox field.

The Clodine field appears to be the most interesting of the Cockfield-Yegua areas. The second test, three miles west of discovery, is drilling, running high on upper markers. Other Cockfield discoveries are the West Silsbee area, Hardin County, which may prove to be a long extension to Silsbee field; and the West Conroe area, Montgomery County, which formerly made only gas.

The first production was opened in the Gulf of Mexico in the Sabine Pass area, 1½ miles from the Jefferson County shore line. Two additional tests are getting under way.

The Frio discoveries, with one exception, are still one-well fields.

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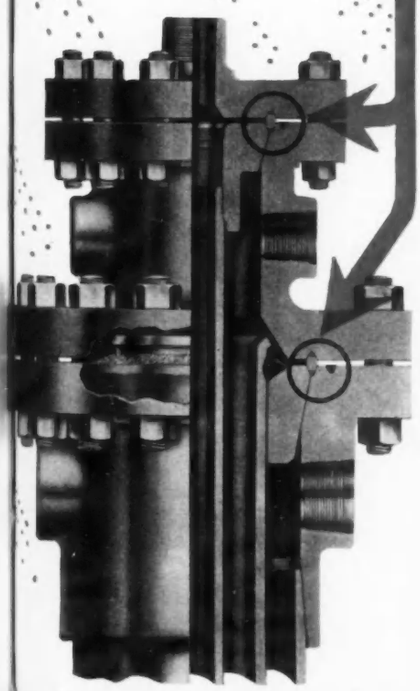

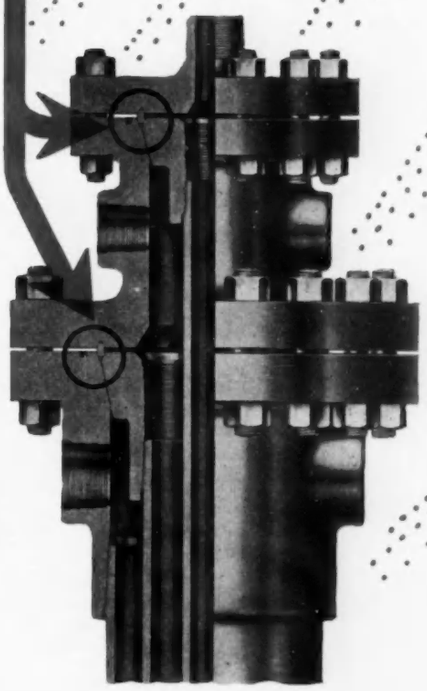

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Chenango has two producers, but has been defined with dry holes on the east and south. The others are Hall's Bayou, Brazoria County, where the discovery flowed for a while from sand around 10,300 feet, but was abandoned after casing collapsed twice; Lucky, Matagorda County, opened at 8850 feet, with two outposts now drilling, and Oyster Bayou, Chambers County, opened just west of the Willow Slough field.

Although they failed to provide the increase in reserves that were accounted for in other formations, Wilcox-sand strikes topped Southwest Texas expansion during the past six months. Four discovery wells finished during the period were in the lower formation; one discovery was in process of completion, and two more were indicated in that zone. Wilcox play in Southwest Texas is less than four years old, but recent discoveries suggest a material expansion in deep wildcatting.

Second in exploration importance was discovery of crude in Frio sands flanking condensate structures. Millions of barrels of new reserves resulted from this work, and now one of the most active drilling programs along the lower Gulf Coast is centered around this type of play.

In all, 20 Southwest Texas counties gained discoveries, either new fields or new sands.

The southern corner of Colorado County and the southeastern quarter of Lavaca County, extending to the DeWitt County line, was the center of the highly important Wilcox play during the first half year.

Frio flank exploration centered around Agua Dulce-Stratton area in Nueces County, with a series of new sands opened from 6000 to 7200 feet. The crude zones indicate similar condensate or wet gas structures of high relief which should provide additional reserves when finally explored. Work is spreading to other areas.

While its exploration has been limited to zones already uncovered, Rincon field, Starr County, bids for near top honors in the 1941 drilling program. One company, controlling the structure, has a program of approximately 125 wells this year to sands from 3900 to 4400 feet, all in the Frio.

Jackson County maintained the lead in Southwest Texas activity. Two new pays were opened in the West Ganado area, while exploration materially expanded the limits of both the West Ranch and Lolita fields. Probably the best strike of the period was La Ward (Maurbo), in a 5200-foot Marginulina sand, large producers resulting in every completion. Until recently, one company controlled the entire structure, but expansions have brought holdings of five or six others into line for development.

San Patricio County's key strike was a blanket 6000-foot sand under the Midway structure. The 5300-foot zone, heretofore only producing level, yields considerable salt water with the crude.

The San Antonio region experienced a revival of shallow activity, with Cretaceous the source of a number of completions. Bee Creek, in Caldwell County, provided some excellent producers with revised completion methods. The Carrizo extension of the Chittim anticline produced crude commercially when Dimmitt County's first field was opened, a 2300-foot well producing from the Navarro formation.

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couraged new exploration. Three plants were completed, La Gloria Corporation's plant at La Goria, Jim Wells County; Gulf Plains Corporation's project in the Stratton-Agua Dulce region of Nueces County, and Gulf States Oil Company's plant in the San Salvador field, Hidalgo County. Preparations are being made to double the size of the Corpus Christi Corporation's plant in the Stratton field, Nueces County, and new plants are under way or immediately planned in Sejita, Duval County; Francitas, Jackson County; Rincon, Starr County, and McAllen, Hidalgo County. Several others are being surveyed.

Advancement of cycling has brought a new method of completion, multiple sand wells. La Gloria, Stratton and Agua Dulce are being developed in this manner as many as three sands being produced from the same well with use of special flowing equipment set on packers.

Eighteen new oil fields were opened in Illinois, compared with 13 discoveries in the first six months of 1940.

The outstanding pool of the period is Benton, Franklin County, discovered early in January, a 350-barrel Tar Springs sand well. At the end of June, the field had 110 Tar Springs producers, making approximately 30,000 barrels daily. Average depth of producers is around 2160 feet.

Ranking second is the Dahlgren field, Hamilton County, which now has about 25 McClosky producers.

Principal new pay zone discovered in a productive area was at Loudon, Fayette County, where the Devonian lime became the field's fourth productive horizon. Only one completion was made in the formation, but six other tests were nearing completion.

The half year's 18 discoveries boosted the total number of new Illinois fields to 101, all of which have been discovered since 1937.

During the last half of the year White County will continue to be intensely explored as will Saline, Gallatin, Hamilton, Franklin and Wabash counties. A continued upswing in wildcatting was anticipated because of a firmer crude market.

Indiana Has Six Strikes

Four oil pools and two gas areas were opened in Indiana. Principal discovery, the South Bufkin pool of Posey County, finaled in the Cypress sand at 2469 feet for 52 barrels of oil and two barrels of water in 24 hours, pumping.

Wildcatting Slumped in Michigan

Wildcatting slowed down and new discoveries fell to the worst level in six years in Michigan, but development was picking up late in the first half by virtue of activity in districts discovered in 1940.

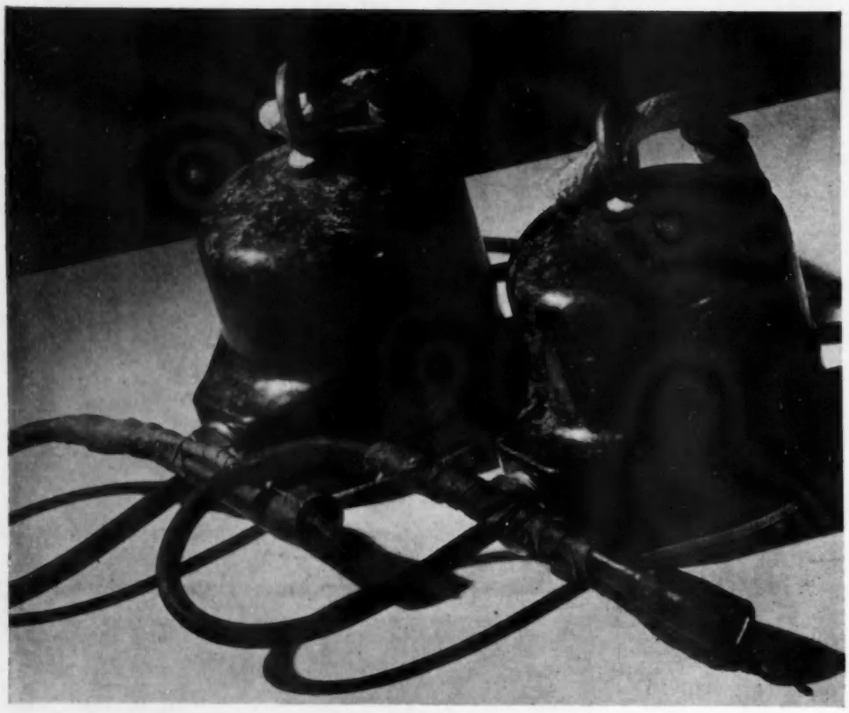
Reed City, Osceola County, opened in 1940, did not have its third completion until June this year, when first big production was uncovered. It held promise of becoming a major field for the state. A blowout and fire followed by an extended fishing job held up completion of Michigan's first real deep test, a well projected to 10,000 feet.

None of the 1941 discoveries had been proven as important field openers.

Oklahoma Discovery Rate High

Oklahoma wildcat activity rewarded operators with the largest number new-field discoveries for the past five years.

Majority of discoveries have been small pools, five to eight wells but four areas may develop into sizeable fields, Guthrie, Logan



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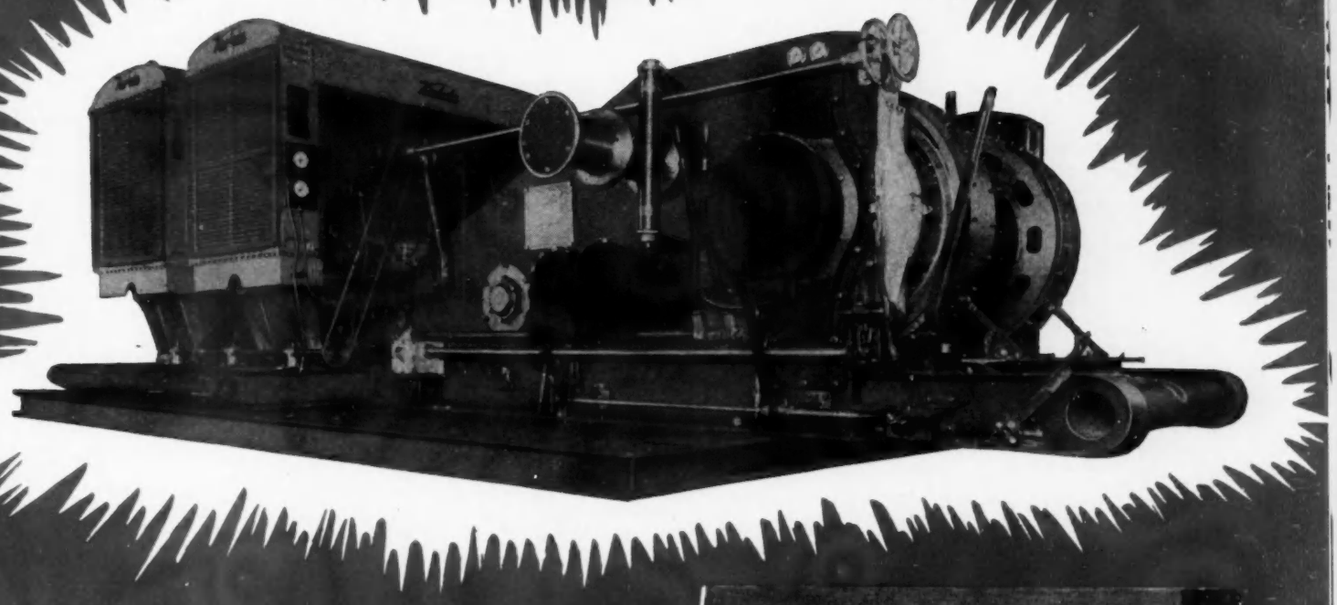

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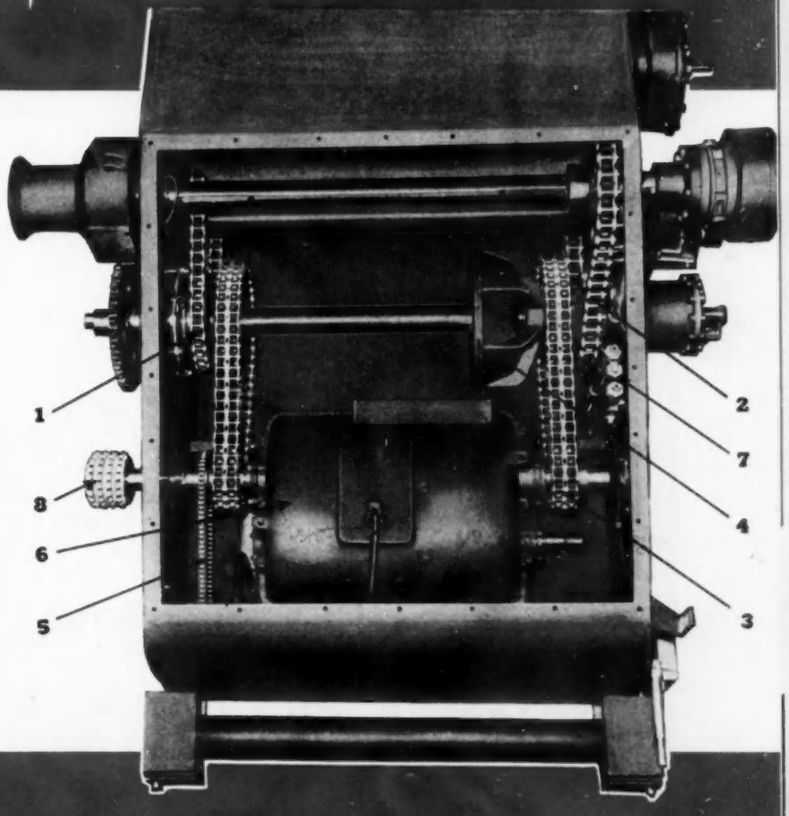
The photograph at right shows the interior of the Model CT-5 Draw Works: (1) High speed drum drive independent of transmission; (2) Low speed drum drive, giving 4 forward and 3 reverse speeds to drum; (3) Drive to rotary shaft, providing 4 forward and 3 reverse speeds to rotary table; (4) Cone friction rotary clutch; (5) Oil pump drive independent of transmission speeds; (6) Heavy duty herringbone transmission; (7) Pressure regulator assembly for lubrication system; (8) Transmission input sprocket, quadruple width.

A complete description of this and other Portable Rigs is carried in the 1941 Composite Catalog, or write for descriptive literature.



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County; Tecumseh Lake, Pottawatomie County; Apache, Caddo County, and Deep Bromide in Velma pool, Stephens County.

The Guthrie discovery showed that a structure geologically indicating bare possibilities of production from surface and sub-surface work, could provide oil over a relatively flat area in prolific quantities. The discovery well flowed 2444 barrels daily on completion from Second Wilcox sand at 5442 feet. North-south axis of the structure will be less than a mile, but east-west trend may be broad.

Tecumseh Lake pool, also a Wilcox-sand source, compares closely with Guthrie in importance, although it is a smaller area. Production is defined to the northwest. The discovery established a potential of 4047 barrels daily. Offsets have been smaller.

Southern Oklahoma received a deep Bromide-sand source in Shallow Velma pool, Stephens County, somewhat comparable to the Oolitic lime discovered some years ago at Fox pool, Carter County. Steeply dipping beds indicate a sharp, well defined structure, and will probably limit penetration below 8000 feet.

Designed to Insure Maximum Safety

One of the outstanding features of the McKissick Floor Block is its SAFETY. The guards are so constructed that they do not need to be detached for the purpose of threading the line. Minimum wear on line and sheave is assured due to the use of the Universal Adapter which allows plenty of side sway. A ball bearing swivel assembly permits the block to freely swivel under heaviest loads. Safety Floor Blocks are available in four sizes with single bearing, and two additional sizes with double bearings — sheave diameters from 12" to 24".

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See Composite Catalog—Page 1652 for complete description and prices

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Kansas Strikes Small

New-field discoveries in Kansas were on par with previous years, small in area with no outstanding pools. Older areas of Greenwood and Butler counties re-entered the picture with the Severy area, Greenwood County, responsible for major drilling activity. Arbuckle lime provided the largest number of strikes, other discoveries finding Lansing, Gorham, Bartlesville, Fort Riley, Topeka, Simpson, Conglomerate, Quartzite, Viola and Pre-Cambrian pays.

An increased number of wells adopted two-zone completion method, producing alternately with an adjustable packer between Lansing-Arbuckle lime, or Topeka-Gorham sand. New horizons were proven at Iuka, Geneseo, Bloomer, Shaeffer, Davidson, Breford, Stafford and Dubuque pools.

Barton and Russell counties proved most profitable to wildcatters.

Nebraska Still to Be Explored

Potentialities of Nebraska were hardly touched during the first six months, activity centering principally in Falls City and Shubert pools, both in Richardson County. A conservative drilling program was followed in each area. Nemaha County witnessed numerous wildcat failures.

Shubert was extended a mile west with a 187-barrel Hunton-lime producer. Northwest Falls City pool was opened on a separate structure, as defined by two dry holes between producing areas. Four producers, none making water, were completed.

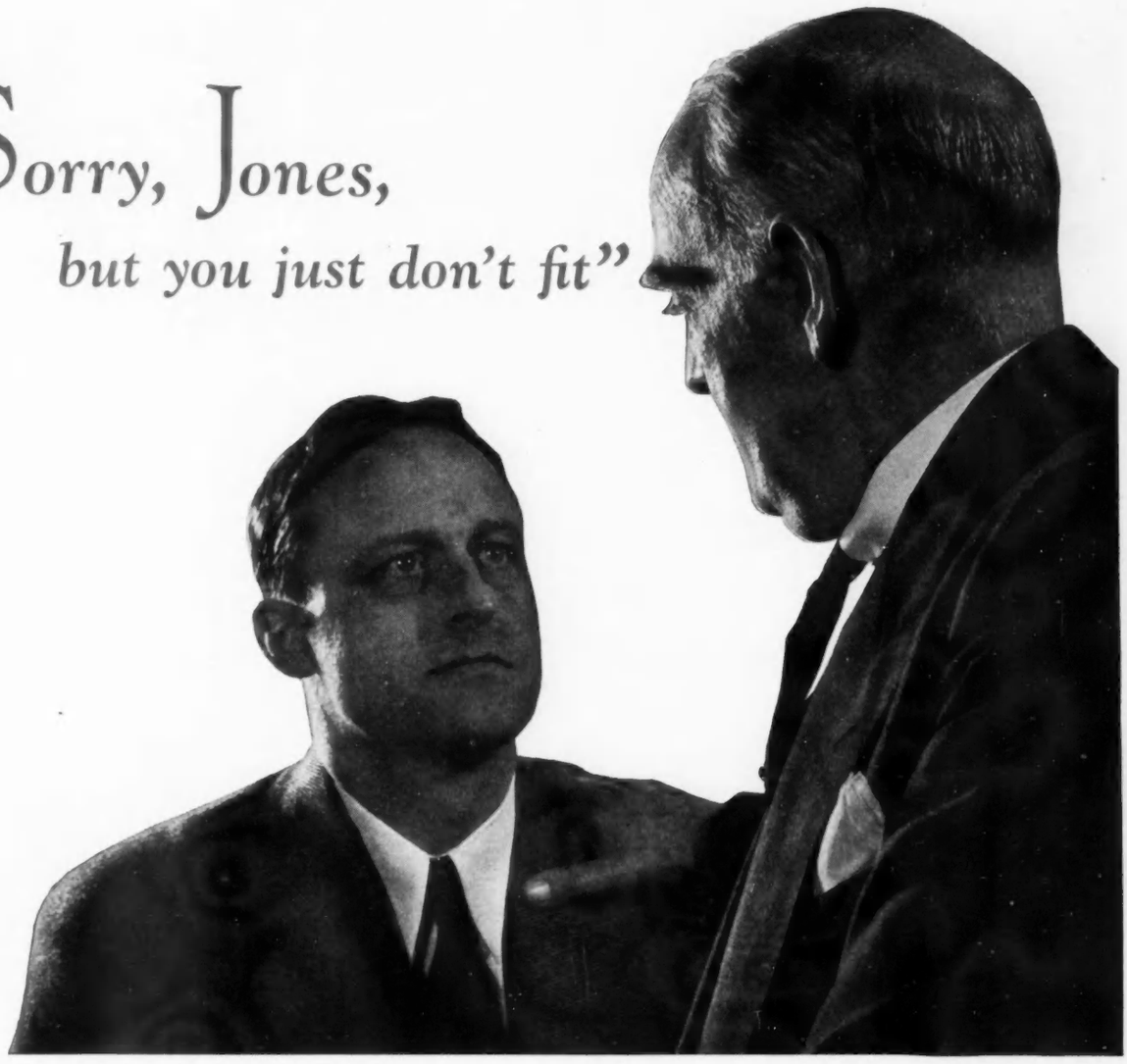
Outstanding inside development featured prolific Hunton-lime production at deeper level in Falls City pool. Producers now making considerable water in upper Hunton lime may be deepened to the new horizon.

Extension of Central Kansas Uplift was tested by three wildcats in Furnas County, all failures. Trending further northwest, the flank of Cambridge arch was tested in Dawson County, but the test penetrated the geologically low end of a prominent structure.

Twelve for South Louisiana

Of 12 oil fields opened in Southern Louisiana, Pine Prairie and St. Gabriel promise to require the most new drilling. Pine Prairie has three producers from the Cockfield sand, with two tests drilling.

"Sorry, Jones, but you just don't fit"



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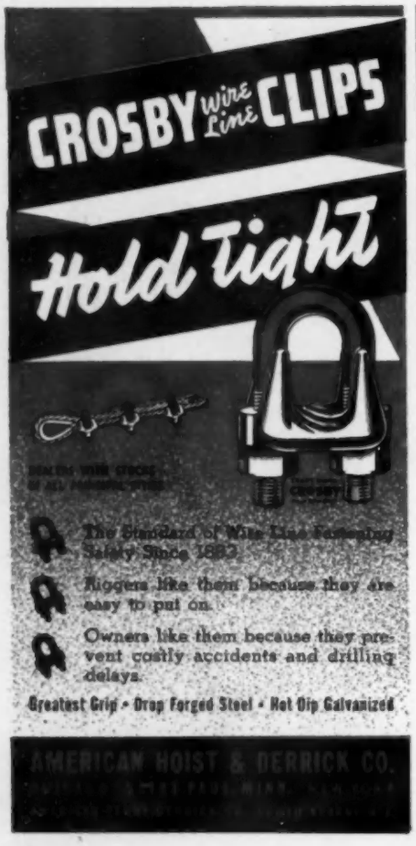
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St. Gabriel has six producers, five flowing from a 7700-foot pay, and one from a new 8600-foot zone.

Unknown Pass field, Orleans Parish, was brought in late in June with a 640-barrel well at 9886 feet. Previously, the discovering operator drilled six deep dry holes in the area. Bayou Sale field, St. Mary Parish, was opened by a test drilled to 12,487 feet, plugged back to 10,125 feet, and perforated to make 9 barrels of 36.5-gravity oil per hour. Discovery for the Westwego pool, Jefferson Parish, was drilled in January, but later abandoned. A test east of the discovery was completed through perforations at 8993-98 feet, making 246 barrels daily.

The east flank of the Anse La Butte field was given deep production with a 535.56-barrel well through perforations at 9430-40 feet. It is probably the most important flank discovery of the year because of the leasing play which has been carried to other flanks of piercement-type structures. Pine Prairie, Section 28 and Belle Isle are new pools as a result of deep flank drilling. The deep sand discovery on the northwest flank of Section 28 dome, St. Martin Parish, was completed through perforated casing at 10,854-862 feet, making 260 barrels of 27.5-gravity pipe-line oil daily.

In Cameron Parish, two deep gas-distillate fields were found, Pecan Lake below 10,000 feet, and Lakeside discovery just above 10,000 feet.

Other new fields are Port Allen, West Baton Rouge Parish, opened at 9600 feet; Delacroix Island gas field, Plaquemines Parish, at 8900 feet, and Delta Duck (Octave Pass), Plaquemine Parish, at 11,370 feet.

In the East White Lake field, two wells were completed at the same time in two different pays, at 9800 and 7300 feet.

North Louisiana and New Mexico

Most important discovery in North Louisiana was distillate production in the Smackover lime on the northeast flank of the Lisbon field, 2½ miles north of nearest oil production at 5200-5300 in the basal Glen Rose lime. The discovery was completed at plugged-back depth of 10,397 feet. It is the first time commercial production has been found in this deep horizon in North Louisiana. No additional Smackover-lime tests have yet been drilled, due to controversy as to spacing.

Only one well has been drilled in the newly discovered Catahoula Lake field, LaSalle Parish, where the discovery was completed in the Wilcox, making 15 barrels of oil per hour. The Ajax area, Natchitoches Parish, has only one small oil well, although a ½-mile west outpost has shown for a dry gasser. Producing formation is the Fredericksburg. The discovery well showed the oil sand very thin and immediately underlain by salt water sand, making its value problematical.

New Mexico's drilling activity declined during the period. The Maljamar field, oldest Lea County area, accounted for greatest volume of drilling, and productive limits likely to be expanded as long deferred development progresses.

Prospecting yielded a small oil pumper in Eddy County, and was revived somewhat in Lea County. Search for deeper pays within the Lea County producing areas is contemplated should wildcats now under way and projected fail to uncover important producing structures.

California Seeks Deep Zones

Discovery of the Sentous deep zone in the Inglewood field, Los Angeles County, appears the most important new development in California. While it will require considerable development before definite conclusions can be drawn, thickness of productive measure in the discovery, together with pressure data obtained in this well and the second completion in the zone, indicates a substantial oil body has been brought into production.

While not completed, a deep test in the Rincon field, Ventura County, appears important. It cored several new deep zones which check closely with the lower measures in the Ventura Avenue field southeast. Difficulty has been experienced in controlling flow while fishing tubing. Well was taken to 9337 feet, and is being tested by stages.

Some 2000 acres were added to the proven limits of the Paloma field, Kern County, with completion of an eastern outpost. This is a distillate field, and the entire area is shut in pending completion of a unitization program.

In Fresno County, a gas field was opened in the Raisin City area at 6429 feet, making over 3,000,000 feet of gas, with a small amount of condensate. Several wells are drilling in this area.

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Made up on the drill pipe, the DRIFTMASTER is run to bottom in the same manner as an ordinary drilling bit. When bottom is reached the automatic features become operative with the application of weight, and the DRIFTMASTER *orients itself to the low side of the hole.* Drilling may be begun almost immediately without first running a check survey or orienting the pipe.

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Pipe-Line Construction at High Level; Banner Year in Prospect

PIPE-LINE construction activity during the first six months of 1941 hit a rapid pace, especially at the close of the period, indicating projects already complete and being built will provide considerably more than the approximately 3000 miles of trunk lines constructed during 1940.

In addition several very lengthy projects hinge on passage by congress of legislation giving pipe-line companies the right of eminent domain in acquiring right-of-way. If this bill is passed, as expected, 1941 should become the most extensive pipe line construction year in a long time. Among proposed projects are one and possibly two crude lines, and a products system from the southwest to the eastern seaboard, each of which would be 1500 miles or more in length. In addition, the pipe-line bill would assure construction of a products line from Baton Rouge, Louisiana, to Greensboro, North Carolina, and completion of a products line from Port St. Joe, Florida, to Chattanooga, Tennessee.

Crude carriers from the southwest to serve the Atlantic seaboard, urgently needed to meet a threatened shortage because of increased demands of the defense program and by diversion of 50 tankers from the Gulf Coast-Atlantic trade, may originate in East Texas or West Texas, and both may be constructed. A line starting in West Texas is urged by Oklahoma and Kansas operators, who would not benefit from an East Texas-Atlantic line.

Pipe has been ordered and right-of-way is being taken by Plantation Pipe Line Company for a products line from Baton Rouge to Greensboro, and there is a possibility it may be extended north to Baltimore. Actual construction hinges on passage of national legislation giving pipe-line companies right to condemn right-of-way, now denied in Georgia and a few other states. Such legislation, now pending in congress, would also permit completion of Southeastern Pipe Line Company's project from Florida to Tennessee, now finished except for railroad crossings in Georgia.

Standard Oil Company of New Jersey is building a 250-mile line from Portland, Maine, to Montreal, Canada, which will be used to move 50,000 to 60,000 barrels of crude daily brought to a Portland marine terminal by tanker from Gulf Coast and South American fields. It is designed to save one-third of the normal tanker voyage from Gulf ports to Montreal, and to make possible year-around deliveries. Tankers are unable to make deliveries up the St. Lawrence River during winter months.

Most Texas Lines Short

Pan American Pipe Line Company early this year completed a trunk line from the Longview section of the East Texas field to Houston, where connection was made with the company's 12-inch carrier to Texas City. It involved 58 miles of 10-inch and 137 miles of 12-inch.

Pipe line construction in Texas outside the coastal belt was confined to comparatively short-length and small-diameter units during first half 1941. Two projects involved refined products carriers.

Pending work, excepting interstate carriers under consideration as defense measures, may involve substantial gain in the pipe-line outlet for the West Texas-New Mexico district. Several companies are likely to loop present systems to the coast, while Stanolind Pipe Line Company is a prospective entrant with an extension from the Ranger district. North Texas will receive a number of comparatively short extension lines to new fields undergoing development, and further realignment of trunk lines so as to step up crude deliveries to the middlewest and east. Several natural gas transmission lines are under consideration for East Texas, including the construction by Lone Star Gas Company of a carrier from the Willow Springs deep area to connect with its system at Opelika, Henderson County.

In West Texas, Richardson Pipe Line Company provided the fourth outlet for the Slaughter field through completion of a 44-mile 6-inch discharge line and 20 miles of gathering lines. Stanolind Oil & Gas Company installed a 12½-mile gathering system in the Slaughter field, making connection with the Richardson Pipe Line Company's carrier. Stanolind Oil & Gas Company also built 8 miles of 4-inch gathering and discharge lines to provide the first outlet for the Cedar Lake field, Gaines County. Other short lines gave initial outlets for the Soma-Noelke field, Crockett County; Walker pool, Pecos County, and the Northwest shallow field, Mitchell County. A 20-mile 6-inch carrier from Crane Station to the Abell field, Pecos County, was authorized by The Texas-New Mexico Pipe Line Company, but actual work held in abeyance.

Pipe line activity in North Texas was confined to short units, other than the replacement of 25 miles of 4-inch with 6-inch between Nocona and Muenster stations by Stanolind Pipe Line Company. The latter also built a 6-mile 4-inch extension from Muenster to the Voth shallow field. Initial outlets were provided the Asylum, Vogtsberger and Scotland pools by Magnolia Pipe Line Company. Sinclair Refining Company connected to the Bindel and Anderson-Kerr pools, Cooke County, with short extensions. Pending work involves the entry of Stanolind Pipe Line Company into Baylor County with a 20-mile extension from K-M-A, and the installation of a supplemental 8-inch from Electra to Devol, Oklahoma, while Bell Oil &

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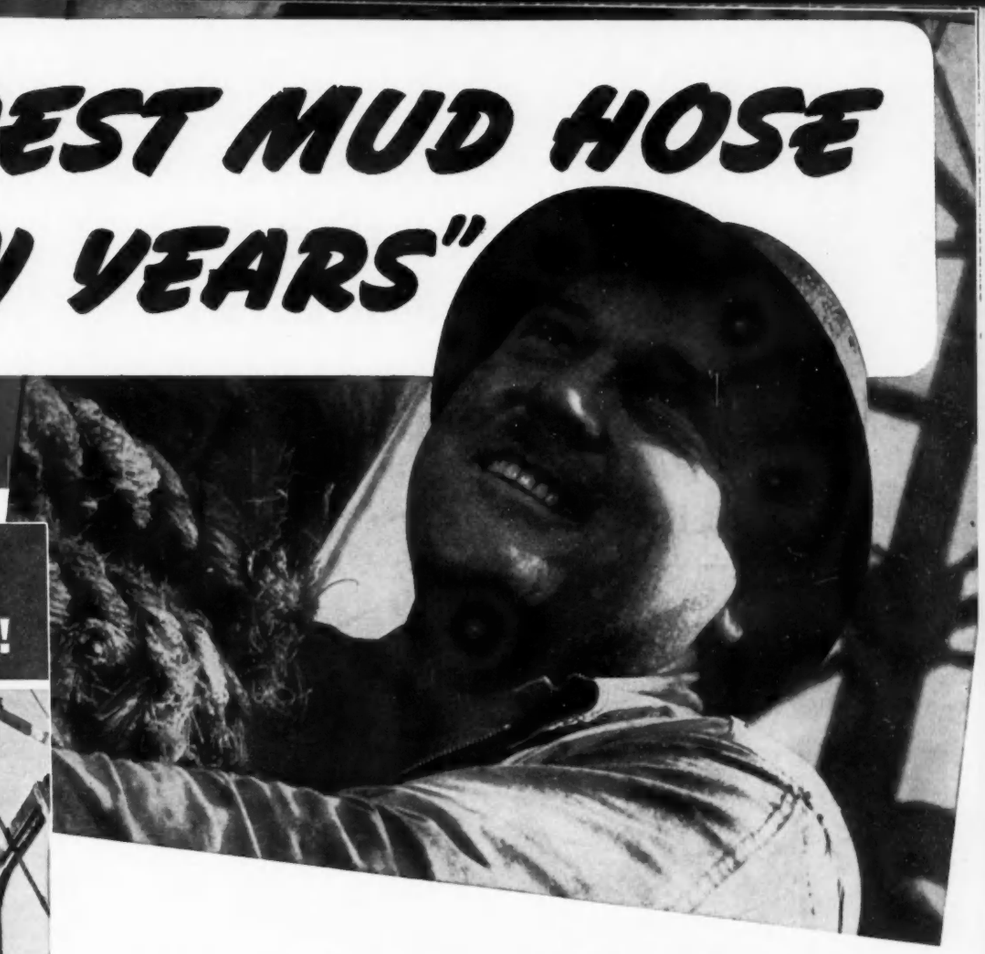

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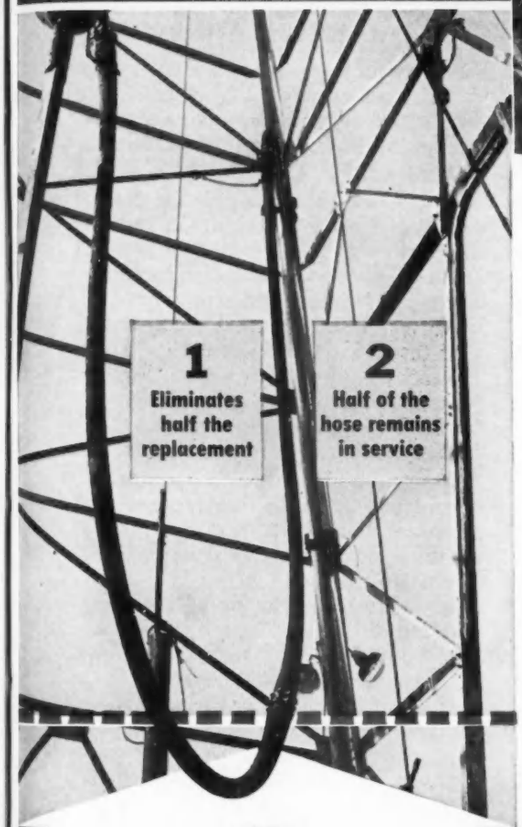

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Gas Company proposes to build from the Burkburnett district due west to the Fargo field, northwestern Wilbarger County.

In West Central Texas, Baird Refining Company built a 26-mile 4-inch crude line from the Novice and Goldsboro fields in linking same with its refinery near Baird, Texas.

Sinclair Refining Company began construction in late June on a 31-mile 3½-inch refined products line from its Fort Worth refinery to Dallas. Gulf Refining Company built a 37-mile 4-inch line from Opelika field to its Big Sandy mainline station, near East Texas field, to accommodate daily movement of 5000 barrels of distillate purchased on 5-year contract.

Southwest Texas Activity Up

Construction showed a spurt in Southwest Texas. Natural gas, crude and condensate systems were completed, started and announced.

Valley Pipe Line Company sold to W. R. Davis, Inc., its entire Rio Grande Valley system, including 190 miles of 4½- and 5-inch line from Brownsville ship channel to fields in Hidalgo, Starr and Brooks counties. The purchasing company will replace a 120-mile section from Rincon to Brownsville with 8-inch pipe. Salvaged pipe is expected to be used for gathering systems and further valley feeder extensions.

Magnolia Pipe Line Company completed a crude line from East Premont field, Jim Wells County, to the company's deep water terminal at Corpus Christi. First 45 miles east from the field is 6-inch and remaining 6½ miles is 8-inch. One booster station was constructed. Capacity is 10,000 barrels.

Magnolia Petroleum Company constructed a 4-inch condensate line from La Gloria field to a point near Premont, then a 6-inch line to terminal at Corpus Christi, and on the same right-of-way as a crude line. It is 65 miles long with booster station at La Gloria, and has capacity of 6500 barrels.

Humble Oil & Refining Company is reported planning a condensate line from the East Alice field to Corpus Christi or Ingleside.

Long South Texas Gas Line

Magnolia Petroleum Company is building a 193-mile natural gas line from West Ranch in Jackson County to its refinery in Beaumont. It will use 163 miles of 14-inch from

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THE GUIBERSON CORPORATION

DALLAS, TEXAS

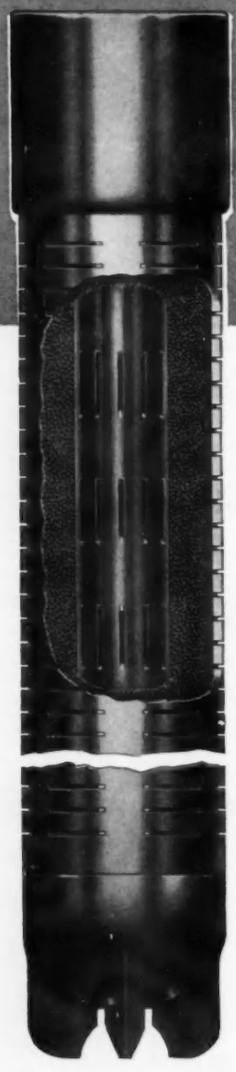
Representatives in every important oil field in the United States. BRANCH OFFICES: Houston, Texas; Tulsa, Okla.; Newark, Ohio. WAREHOUSES: Seminole, Kilgore, Alice, Texas; New Iberia, La. Distributors: W. R. Guiberson Co., Los Angeles, Calif. Eastern States: L. C. Wigton, Olney, Ill.
Export: I. Frank Brown, New York City.

the field, and 30 miles of 16-inch to the plant. Capacity will be 50,000,000 feet. Magnolia Pipe Line Company is building a booster station just west of Ganado on its 73-mile 8-inch line from West Ranch to Sealy switch. It will increase the line's capacity to 17,000 barrels daily. The company has built about 25 miles of 4- and 6-inch feeder lines in Jackson County, tying Lolita, La Ward and other areas to its West Ranch line.

Southern Pipe Line Company completed a gathering system and 12 miles of 4-inch line from Stratton field to Bentonville-King area in Nueces County, where line is tied into a trunk system to Corpus Christi terminal. One booster station is operating at Stratton. Capacity of the line is 6500 barrels.

Sinclair Prairie Oil & Gas Company completed 10 miles of 4-inch gathering system in East White Point field, San Patricio County, and four miles of 6-inch line across Nueces Bay to Southern Pipe Line Company's Corpus Christi tanker terminal.

Steel and Gravel
TO PROTECT
YOUR WELL INVESTMENT



LAYNE
Hydro-Pak

Sand-laden fluid can cause terrific damage to pumping equipment—seriously disrupt the productivity of your wells.

There's no need to risk such a situation. Layne Hydro-Pak effectively controls the volume of sand that can enter the tubing.

Hydro-Pak has fine gravel placed by hydraulic pressure between two sections of seamless steel slotted pipe screen. The gravel baffles the flow—retards the entry of sand.

The two sections of pipe are rigidly anchored so there can be no shifting or loosening of gravel. Hydro-Pak cannot be damaged while going in hole.

Hydro-Pak can be made in any length for any size casing.

"When you need a pre-packed gravel screen, there's no substitute for Hydro-Pak."

Layne & Bowler Co.
Houston, Texas
EXPORT: E. H. (GENE) TRAMMEL, ROOM 1636, 30 ROCKEFELLER PLAZA, NEW YORK, N.Y.

Oklahoma Has Looping Projects

Principal construction in Oklahoma during the six months was extension of gathering systems to new crude sources.

Gulf Refining Company will use 203 miles of 10-inch pipe to loop its line from Glenn pool, Oklahoma, to Dublin, Indiana, to increase capacity of crude line 11,000 barrels daily.

Stanolind Pipe Line Company completed a 160-mile looping project to segregate three grades of crude for movement from North Texas to Whiting, Indiana.

The Pure Oil Company switched movement of Cumberland crude south to their Smith Bluff refinery, Texas, and will lay 36 miles of line from present station to Fitts pool, Pontotoc County. Oil will be moved to Chicago terminal.

Kansas Active

Kaw Pipe Line Company is constructing 40 miles of 6-inch line from Burnett, Ellis County, to provide outlet for Ray pool, Phillips County, and will construct a 37-mile 10-inch line from Chase to Susank, Barton and Rice counties, looping its main line to increase capacity 25,000 barrels.

Socony-Vacuum Oil Company extended its gasoline line from Topeka, Kansas, to Sioux City, Iowa, originally 250 miles of 6-inch, to 335 miles, terminating at Sioux Falls, South Dakota. Standard Oil Company (Indiana) is laying 82 miles of 6-inch between Sioux City, Iowa, and Sioux Falls, South Dakota, for a gasoline carrier.

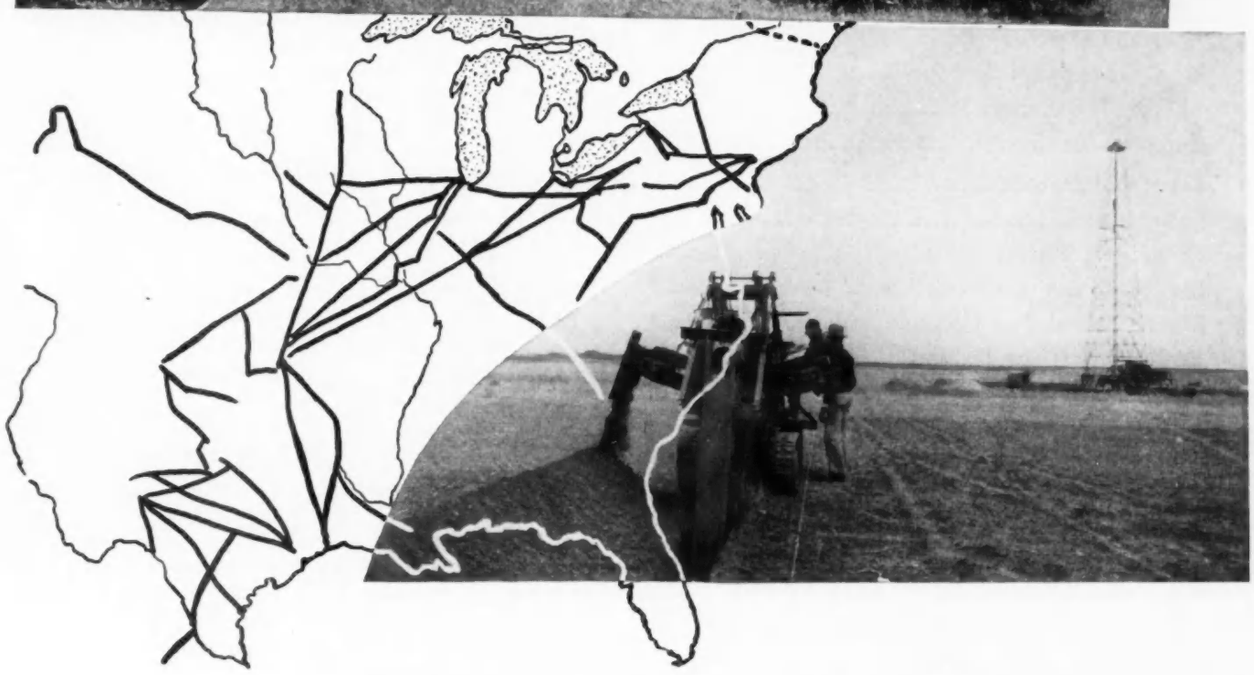
Globe Oil & Refining Company will construct 225 miles of 6-inch from McPherson, Kansas, to Council Bluffs, Iowa, to move products. Skelly Oil Company will build 33 miles of 6-inch from Bloomer pool, Barton County, to the Hall-Gurney pool, Russell County, to extend its existing system.

Socony-Vacuum Oil Company will construct 23 miles of 10-inch loops in Rice County to increase capacity 28,000 barrels daily. Same firm laid 12 miles of 4-inch from Ritz-Canton pump station to Roxbury pool, McPherson County, and in the same county, Phillips Petroleum Company completed 5½ miles of 6-inch near McPherson to increase capacity 6000 barrels daily.

Natural Gas Pipeline Company of America completed 83 miles of 26-inch between Osceola and Muscatine, Iowa, and will lay 88 miles

In the U. S. Alone—

Over 112,000 Miles of Pipeline



—and Buckeye Trenchers dug most of the trench for it! Enough to go several times around the earth—to say nothing of the thousands of miles of pipeline trench Buckeyes have dug in other parts of the world.

Whether it's trunk or gathering lines—across a lease or across a nation—the fastest and least expensive way to make trench is the Buckeye way!

Six models designed specifically for pipeline work—not a "lacy pants" in the lot—tough, rugged, simple—built for years of service with minimum maintenance. Levantine sands, mid-continent clay, Venezuelan marsh—put a Buckeye to work in any terrain and you get trench—on schedule.

For real teamwork, put Buckeye Backfillers and Bulldozers to work with your Buckeye Trenchers.

BUCKEYE TRACTION DITCHER CO.
Findlay, Ohio

Built by Buckeye

THE FIRST NATIONAL BANK AND TRUST COMPANY OF TULSA

STATEMENT OF CONDITION, JUNE 30, 1941

RESOURCES

Cash and Due from Banks	$29,294,766.67	
U. S. Government Securities	9,384,892.38	
Municipal Securities	3,555,787.74	
Corporate Securities	209,949.18	$42,445,395.97
Loans and Discounts		21,615,601.98
Overdrafts		1,677.53
Other Real Estate		1.00
Federal Reserve Bank Stock		120,000.00
Income Earned, Not Collected		115,964.36
Bank Premises and Fixtures		1,154,958.91
TOTAL		$65,453,599.75

LIABILITIES

Deposits		$59,695,810.77
Income Collected, Not Earned		111,998.42
Taxes, Interest and Expense—Accrued		106,181.16
Capital (Common)	$2,000,000.00	
Surplus	2,000,000.00	
Undivided Profits	1,092,381.19	
Reserves	447,228.21	5,539,609.40
TOTAL		$65,453,599.75

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Egan **WATER CANS and COOLERS**

Made of copper alloy iron, with recessed bottom and of triple braced construction.

Dead air space surrounding the inner can assures effective insulation and requires a minimum of ice.

Wide mouth with close fitting flanged cover excludes dust and dirt, makes for convenience and reduces evaporation.

Extremely durable and will withstand hardest use in the field.

Sizes 1½ Gallons to 15 Gallons
AT YOUR LOCAL SUPPLY STORE

EGAN MANUFACTURING CO., EL DORADO, KANSAS

of 26-inch gas line between Meade and Kinsley, Kansas.

Major construction project started in North Louisiana was Southern Natural Gas Company's 135-mile 10-inch line from Logansport, Louisiana, to Monroe, Louisiana, where it will link with the company's trunk from the Monroe gas field to Birmingham, Atlanta and other southeastern cities.

Large Michigan Gas Line to Start

Completion of a 60-mile 12¾-inch gas transmission line for the Consumers Power Company between new fields in Clare and Missaukee counties and the company's main line into the Saginaw Valley was the chief construction project of the past six months in Michigan.

Gas transmission also will account for the state's biggest pipe line project, this year or any other year. Panhandle Eastern Pipe Line Company will build 275 miles of 20-, 18-, 16- and 12-inch line, with work tentatively scheduled to begin this month. It will start on the company's present 1200-mile line from Texas-Kansas fields to Detroit at a junction at the Michigan-Ohio line near Toledo, running north to Saginaw and west to Kalamazoo. Texas and Kansas gas will be supplied to existing distributing utilities in 66 cities and towns. Panhandle officials estimated the cost at $4,633,000.

Bay Pipe Line Company's 15-mile 4½-inch line from Standish to a junction on the company's older Buckeye to Bay City line was the principal oil-line project. Sohio Pipe Line Company plans a 35-mile 6-inch line to its present trunk line into Mt. Pleasant from the new Reed City field if new drilling shows adequate reserve.

Construction work is expected to get under way late in July on a 90-mile 10-inch pipe line by Shell Oil Company to connect the Ventura Avenue field, Ventura County, with the company's Wilmington and Dominguez refineries near Los Angeles. It will give Ventura Avenue its first pipe-line outlet. All oil has been moved by tankship. A gas line has connected the area with the Los Angeles basin market for several years. Cost of the line is set at $1,750,000, and its construction will mark the first major pipe-line project in California in several years. Prospect of tanker diversion from the West Coast was a factor influencing the company's decision to construct the line. Construction is scheduled to start this month.

OIL WEEKLY EDITION

BAASH ROSS News

BAASH-ROSS TOOL COMPANY • LOS ANGELES • HOUSTON • NEW YORK

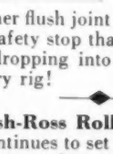
A MONTHLY BULLETIN COVERING NEWS OF EQUIPMENT AND OPERATIONS IN THE PETROLEUM INDUSTRY

BAASH-ROSS REPORTS TO THE OIL INDUSTRY ON LATE DEVELOPMENTS AND OPERATING TRENDS

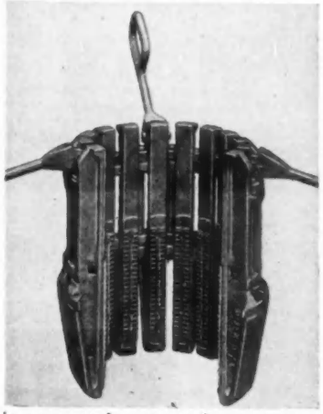
In the editorial pages of this special review issue will be found the records of recent important accomplishments in the oil industry. In many of these achievements Baash-Ross equipment has played an important role. In fact, it has always been the Baash-Ross policy, not simply to keep abreast of the industry, but to keep *ahead* of it... pioneering new developments, new engineering advancements, new ways of getting the job done better... faster... *at lower over-all cost.* Herewith are interesting news notes about Baash-Ross equipment and recent developments...

ROTARY DRILLING

Baash-Ross "Trubore" Drill Collars and Kellys continue to occupy the No. 1 position in modern high-speed drilling operations. Hex Kellys hold the spotlight, with an increasing number of companies adopting them to replace square Kellys after making exhaustive comparative field tests. Any company doing drilling work of *any* kind should investigate the many basic advantages of Hex Kellys!



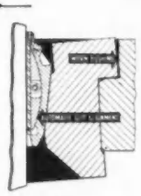
Two revolutionary Baash-Ross *safety* developments of the year—(1) *Drill Collar Slips* and (2) the *Safety Clamp*—have proven extremely popular. The *Drill Collar Slips* are an



important departure from conventional slip design—have narrow segments, flexibly linked together, and *wrap* around the Collar like a chain tong. They *always* give the same full grip *regardless of wear or out-of-roundness of Collar.*

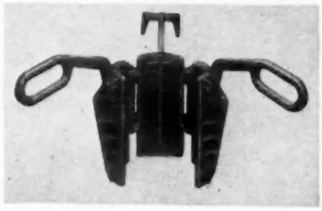
The Safety Clamp, also, is made up of small segments, flexibly linked together. It can be quickly fastened around streamlined drill collars and other flush joint equipment, forming a safety stop that prevents equipment dropping into hole. Should be on every rig!

Baash-Ross Roller Kelly Bushing continues to set new standards of sensitive weight control and frictionless kelly feed. First 2RS Roller Bushing still going like a whirlwind after drilling equivalent of *fifteen* 5000 foot wells without a cent for repairs of any kind. Many companies, after testing, are adopting Roller Bushings as "must" equipment!



Baash-Ross "Self-Aligning" Slips are saving operators many hundreds of dollars in reduced pipe damage and increased crew efficiency. "Self-aligning" principle permits gripping member to automatically align itself with pipe regardless of wear or mis-alignment in master bushing bore.

Baash-Ross Type "CU" Rotary Slips are proving more and more popular among crews. The three segments always maintain perfect alignment vertically, eliminating pipe marking and damage from setting one



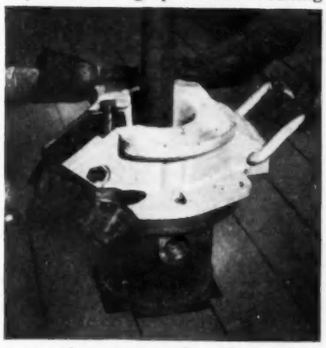
slip too high or too low. Some operators prefer this type, others the "Self-Aligning" above. Both are top-notch in operating efficiency!

SLIM HOLE DRILLING

One of the newest Baash-Ross developments is a special swivelling Clevis for use with the *Baash-Ross Streamlined Tubing Block* in slim-hole drilling. The Clevis replaces regular bail on Block. Elevator links fasten directly to the Clevis, eliminating need for Hook. The Clevis is spring loaded, free-swivelling (with lock to prevent rotation, when desired) and has other valuable features. By eliminating Hook, it saves valuable space in derrick... a particularly important point on slim-hole rigs!

PRODUCTION

Baash-Ross Open-End Tubing Spider leads modernization parade. Operators like its dove-tailed end-gate feature that can be quickly removed to permit setting-up without breaking



connections... yet when dropped in place, rigidly locks entire unit into one piece that will not spread under heaviest loads. Tubing slips have been improved with a new quick-acting lock. Lock snaps shut *automatically* when handles are closed, opens *automatically* when handles are spread. Fast, efficient!

Many new Baash-Ross Streamlined Tubing Blocks go into the fields. On this Block all bolts, nuts, pins, grease fittings, etc., are *completely recessed* into "pockets" in side plates. Not a sharp corner or projection *anywhere* to catch on *anything*—either obstructions in the derrick or clothing of workmen. An important safety advancement. Has other major features, also. (Example, see Slim-Hole Drilling.)

Another important development of the year is the *Baash-Ross Utility Block.* Simple accessory fittings make block into (1) Floor Block, (2) Tubing Block, or (3) Bailing and Coring Block. *Buy* one block, *maintain* one block... but get efficiency of THREE blocks!

Speed of production work in industry is being steadily improved by widespread use of *Baash-Ross Wire Line Wiper* on bailing, swabbing and other wire line work. Wipes line *clean* as it comes out of hole... releases *automatically* when struck by tools.. re-sets *automatically* as tools go back into hole. Keeps mud and oil off of rig, steps up workmen's efficiency, saves time!

FISHING

World's deepest fishing job continues to stand at 14,366 feet—one thousand feet *deeper* than world's deepest producing well... *and a record made with Baash-Ross Fishing Equipment!* On wells of *ALL* depths, the Baash-Ross line of outstanding fishing tools continues to help operators out of tough spots—24 hours a day—in all major fields *coast-to-coast.* There's a Baash-Ross *Engineered* fishing tool for every type of job... each backed by *years* of proven dependability and effectiveness!

A NEW SUCKER ROD COUPLING is said to resist both corrosion and electrolysis. It incorporates a *replaceable* zinc "slug" which protects the steel from corrosive or electrolytic attacks. When used in place of regular steel couplings, the zinc couplings greatly reduce the harmful effect of these agents on sucker rods and tubing, it is said. (No. 71)

BAASH-ROSS

CALCIUM CARBIDE is being used in Ohio and West Virginia fields for removing paraffin from sand bodies at the well bottom. On coming in contact with water, the carbide generates sufficient heat to melt the paraffin and permit bailing it out. In one stripper field so treated, average production of oil was increased from 2 to 13 barrels per well per week at extremely low cost, according to reports. (No. 72)

BAASH-ROSS

TWO SEPARATE PATENTS *were recently issued on similar methods of detecting oil bearing sands while drilling. In both, the drilling mud emerging from the well is passed under ultra-violet light or similar fluorescent-exciting rays and any oil present is automatically indicated by a fluorescence detector.*

[For more information on items that interest you, simply send your name, address and key number on a post card or letterhead.]

These are only a few of the *many* Baash-Ross Oil Tools available *everywhere.* Make Baash-Ross your headquarters!

Practical Operating Hints for

THE practical operating hints for the drilling rig and production man, appearing in these features each week, are secured from oil fields everywhere and offer suggestions that will help to improve field efficiency and safety. The items give an excellent picture of the remarkable ingenuity being exercised by the operating divisions of the industry. Contributions to these features will be paid for at the rate of $5 for each illustrated item accepted. Address contributions to "The Editor, THE OIL WEEKLY, Houston."

1. RIGGING UP

Horses Made of Pipe Support Steam Pipes and Walk, and Provide Sockets for Light Posts

Pipe horses support walks and piping from rig to boiler, provide light standards.

A GULF COAST operator uses horses made of 2-inch pipe to support walks and piping from rig to boilers, as well as to provide a method to erect wiring for the electric light system.

The horses are mounted on skids, each constructed of two triangular end-frames of 2-inch pipe with bottom sides of split 4-inch pipe, inverted to give better weight distribution and prevent sinking into soft ground. Two horizontal rails of 2-inch pipe are welded to the frames several inches below the apex of the triangles to support the walk about 18 inches off the ground.

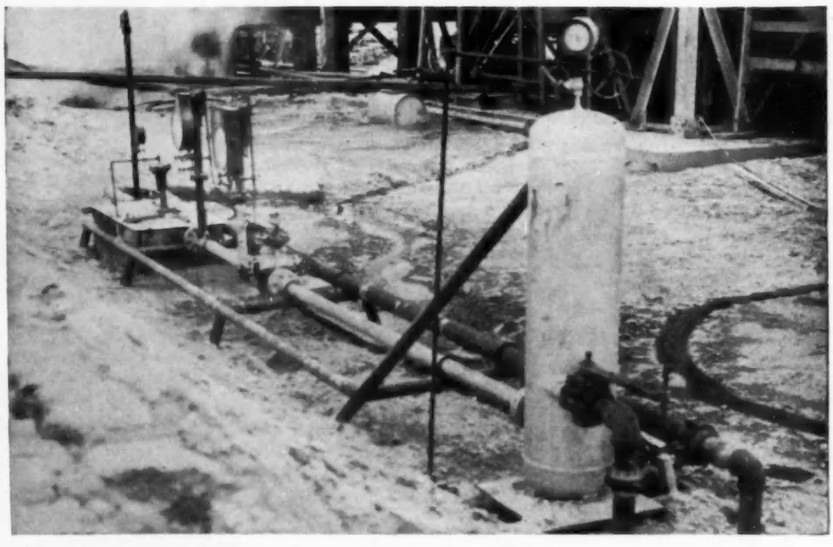
Ends of contiguous boards in the walk are each laid on one of the horizontal pipes, with wooden blocks nailed under the walk sections to assure proper spacing and to prevent planks from shifting and knocking neighboring sections off supports. The blocks lock the planks in place, and the only way to take them off their base is by lifting. Severe sagging is prevented by placing large supports under the middle of the boards, preventing pulling off the horses and facilitating walking by eliminating the bounce which usually accompanies movement of persons on board walks. Erecting the walk is simple. Board sections are uniform in length, and as they are laid a horse is placed under each, offering a convenient and uniform method to convey steam and water lines from boiler to rig.

Every third or fourth horse is specially constructed to allow placing an electric wiring pole. On one side of the horse, at the apex of the triangle, a 2½-inch nipple, eight inches long, is welded vertically. A 2-inch pipe about 8 feet long is stepped in the socket thus formed to support the wiring, and is easily removed when transporting equipment.

2. METERING

Meter Manifold Set for Convenience

BY BREAKING out three couplings, a meter manifold used by John Mabee in Kern County, California, may be moved to another location without disturbing recorders, fuel reducers or scrubber tank. The conventional skid-type base is used. The inlet scrubber is at one end with a tangential nozzle for effective separation of foreign matter from the fuel. The meter orifice fittings are at the center, with a



This skid-mounted meter manifold is disconnected by breaking out three couplings.

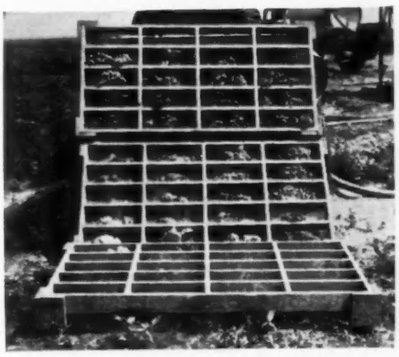
dual connection of recorders for checking the volume used, followed at the other end with an automatic pressure-reducing instrument on the line leading to the battery of boilers.

3. SAMPLING

Racks Aid to Dry Drill Cuttings

DRILL cuttings, sacked while still wet, dry slowly, and there often are delays in forwarding to the laboratory or central office on this account.

One drilling firm provides each rig with a set of trays in which the various samples may be placed for quick drying before being sacked. The trays provide a set of wooden bins, each large enough to hold a sample, with the base of the bins composed of fine-mesh wire screen. By providing the trays with raised corner supports, free circulation of air is assured under the various compartments and up through the wire and into the sample. Where there are space restrictions, the trays may be stacked or racked vertically, with each level assured of air by the elevated supports.



These trays provide a convenient way of drying drill cuttings before bagging.

Identification of the individual samples is obtained by small numbered tags tacked on the side of each compartment, to correspond with depths shown on the drilling log.

When dry, the samples may be sacked, and the cuttings transmitted to the checking point without alteration or delay.—*Perry McNally, Syracuse, Kansas.*

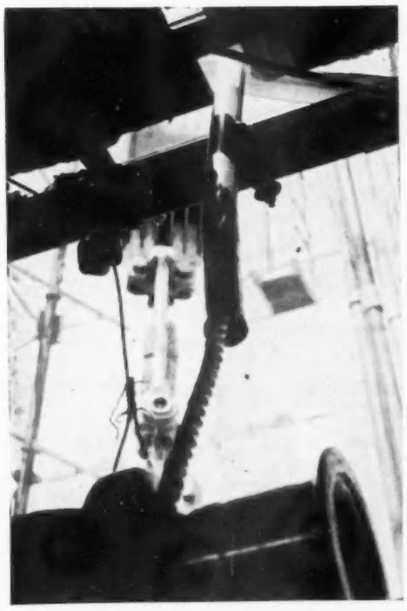
4. ROPE CARE

Pipe Carries Rope Past Floor Level

BY KEEPING the drawworks back under the edge of the lower girt of the derrick, more working room is available between the drilling line drum and the rotary table. This usually brings the cathead back to a point where the catline must be run up through a hole cut in the roof covering the drawworks and engines.

To prevent injury to the catline on sharp edges against which the rope might rub while in use, a number of contractors employ a 3- to 6-foot length of 2- or 2½-inch pipe through which the line can be passed at that point. U-bolts hold the pipe in position against the lower girt and another cross-member higher up. The bottom of the pipe is belled out to conform with the angle at which the line lays as it is looped around the cathead.

Besides protecting the line, the pipe guide serves to keep the catline in one place and immediately available at all times.



Piece of pipe with ends belled saves cat line from injury by sharp plank edges.

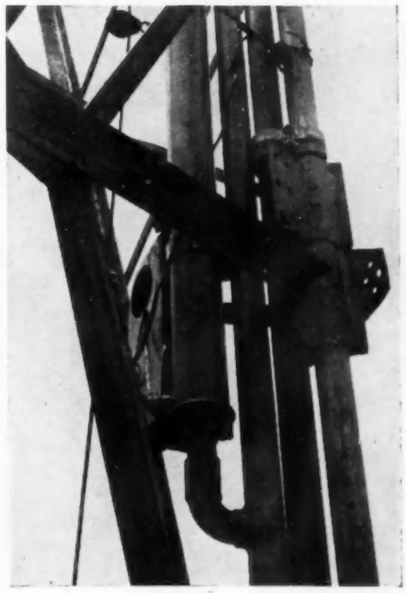
5. MUD HANDLING

Duplex Stand Pipes Reduce Vibration

EXCESSIVE pump vibrations causing irregularities in mud pressure gauge readings and violent agitation of the rotary hose are reduced on one rig by using duplex stand pipes of different sizes to alter flow velocity and absorb pulsations of the mud pumps.

Tying into the regular 4-inch standpipe by an ell welded to it about 10 feet above the derrick floor, a 20-foot cylinder of 6-inch pipe is swaged to connect with the ell, and runs parallel with the regular stand pipe. The top of the 6-inch pipe is also swaged, and makes a similar connection with an ell welded to the standpipe at that point.

Fluid movement occurs through both pipes, but due to difference in capacities the velocities are different, enforcing an unbalanced flow which absorbs pump pulsations, causing nullification of each impulse with consequent reduction of vibration. The pressure gauge, placed on the larger standpipe, records delicate variations in pressure that are readily discerned by the driller.



Duplex stand pipes of different sizes reduce excessive mud-pump vibrations.

Here are the LATEST BJ TONGS

A SINGLE SIZE OF THE TYPE B TONG FITS ALL SIZES FROM 3½" TO 10¾" O. D.

By providing 3 STEPS for latching and 4 JAWS for flexibility, the New Type B Tong handles a wider range of pipe sizes than ever before possible, and yet it fits uniformly around all circumferences between the maximum and minimum. The Latch automatically selects the proper "step" as the tong is closed around the pipe. When equipped with the smallest Latch Lug Jaw, the Type B Tong will accommodate ALL pipe sizes from 3½" to 4½"; by merely changing to the next size Jaw, the same tong will handle ALL sizes from 4¼" to 6¾"; a third Jaw is used for ALL sizes from 6⅝" to 9"; and the largest Jaw fits all sizes from 9" to 10¾". Regardless of the pipe diameter between 3½" to 10¾" all four jaws contact the pipe and equal pressure is exerted around any circumference.

(Above and below) Type B Tong equipped with the one jaw illustrated, will handle all pipe sizes from 4¼" to 6¾".

(Left to right) Jaw for sizes from 6⅝" to 9"—jaw for sizes from 9" to 10¾"—jaw for sizes from 3½" to 4½".

Both the Type B and Type C Tongs have new head and nut type hinge pins, and all wear is taken by a readily replaceable hardened bushing positioned in the male portion of the jaw. Elongation of the holes through the jaws is thus eliminated, and breakage of hinge pins is reduced to the minimum.

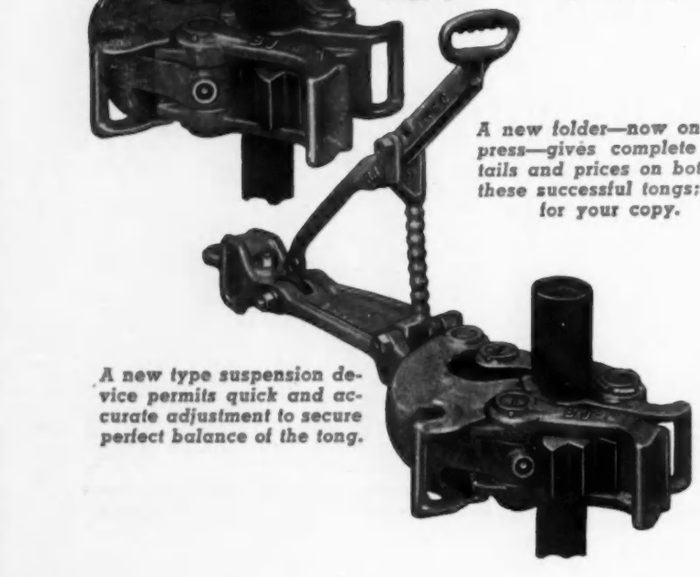
THE NEW BJ TYPE C TONG

For use on portable rigs, and where smaller diameter pipe is used for drilling shallow wells, and for work-over jobs, another new BJ TONG is here offered for the first time. The Type C Tong is similar in design to the Type B, above, but is lighter in weight and is priced lower. This strong, fast handling tong — with interchangeable jaws — fits pipe sizes from 2⅜" to 8⅝" and is amply strong for the recommended lighter duty service.

BJ EXTRA HEAVY ROTARY AND CASING TONG

This popular tong — now in world-wide use — is preferred by many operators and is not being displaced by the Type B Tong. Made to fit all A.P.I. sizes from 2⅞" to 13⅜" it meets a universal need for a tong strong enough to break out drill collars and reamer subs, and fast enough for all casing work.

A new folder—now on the press—gives complete details and prices on both of these successful tongs; ask for your copy.



A new type suspension device permits quick and accurate adjustment to secure perfect balance of the tong.

BJ

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION MEMBER

BYRON JACKSON CO.

Houston • Los Angeles • New York

Leading the DRILLING PROGRESS Parade

1 All drill pipe and casing, from the largest and heaviest strings to the lightest ones, can be safely handled with BJ TRIPLEX HOOKS. The "Triplex" assembly consists of a large lower hook for carrying the swivel bail in a vertical, well-balanced position, and two upper hooks, one for each elevator link. The hooks all are closed, locked, and strengthened by "Locking Arms." The BJ 300 Triplex Hook is for 300-ton loads; the 150 for 150-ton loads; the 100 for 100-ton loads, and the 50 for 50-ton loads.

2 BJ WELDLESS LINKS are constructed with a "Perfection Bend" that brings the lift directly upward under the collar or coupling, thus eliminating undue leverage on the elevator trunnions (ears) and permitting easier handling of elevators. The handy Wire Line Handle is easy to grip and cannot be kinked or bent by rough usage.

3 BJ TYPE G CENTER LATCH ELEVATORS handle the longest strings of external upset drill pipe rapidly and safely without using lifting plugs. They support and lift the pipe by the external upset. The two rugged halves are joined by a strong hinge pin in the rear, and a massive stirrup-type latch fits over lugs in the front so that no load is imposed on the latch pin.

4 BJ TYPE A CENTER LATCH ELEVATORS stand up under the severest pounding of hardened tool joints contacted at high speed in handling collar type drill pipe. Long, guarded operating horns speed up handling with safety, and the protected latch cannot be knocked open accidentally.

5 BJ KELLY BUSHINGS absorb the shock and permit the Kelly to feed smoothly and evenly through the rotary table. An oil-resistant synthetic rubber cushion fits into the corrugated inner bore of the body. Slips with corrugated metal-backs to fit against the cushion are equipped with replaceable anti-friction liners which contact the bearing surfaces of the Kelly. They absorb the driving torque and constantly smooth up and polish the Kelly, thus minimizing the tendency for the Kelly Bushing to take any weight which might cause the Kelly to feed erratically.

6 BJ CASING SPIDERS meet the exacting demands of operators who know the necessity for using a strong, safe spider which will be easy to operate and still grip instantly and positively. The alloy steel body is made in two halves, joined in the rear by a strong hinge pin, and with a massive stirrup-type latch to join the body at the front. The four extra long flat-back slips grip evenly, with a minimum of vertical travel, and are designed to avoid crushing or bottlenecking the pipe under all conceivable operating conditions. Rated capacity, 300 tons; separate slips are provided for casing from 5½" to 13⅜" A.P.I.

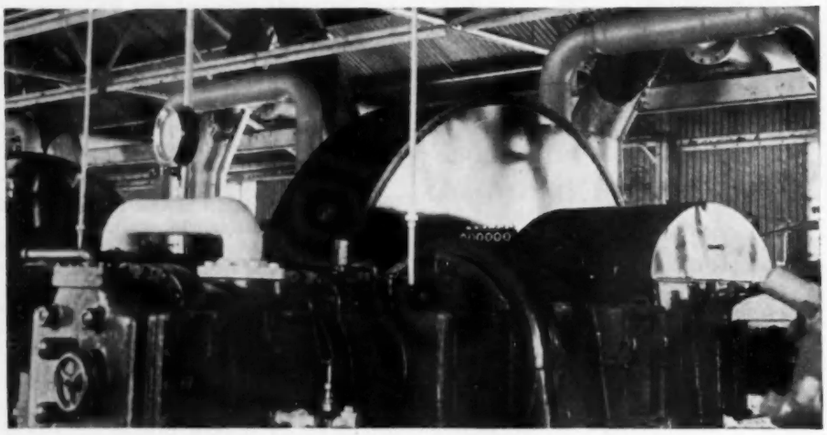
7 BJ ELLIOTT WIRE LINE CORE DRILLS contain exclusive features which permit good cores to be obtained without removing the drilling string from the well. You can drill straight, full-gauge holes—then core—then drill or core in any order and for any footage desired. A patented Venturi type valve greatly reduces the pressure inside of the core-taking barrel. The resultant suction is exerted upon the core as it enters the barrel so that accurate, uncontaminated cores are secured even from sand and other unconsolidated formations.

DRILLING TOOLS

Practical Operating Hints for

1. GOOD HOUSEKEEPING

Steel Housing Over Flywheel Catches Spatter And Enhances Appearance of Station House

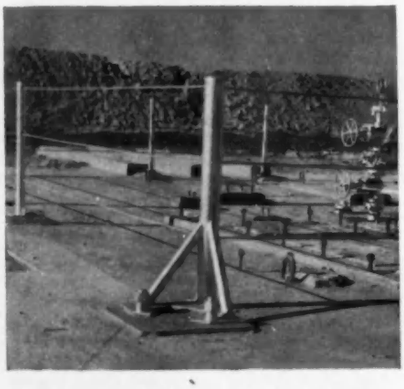


A sheet-steel housing over this flywheel protects workers from flying particles.

FLYWHEEL guards of various types are almost universally found in pump and compressor stations, and at power drives and other installations where accidents might occur if the flywheel were left unenclosed.

At its Louden, Illinois, station, The Carter Oil Company extends the usual protection afforded around the flywheel by enclosing the unit in a sheet-steel housing, slightly wider than the face of the flywheel, and provided with flanged rims carrying side covers that serve as retainers to enclose any oil or other particles thrown off by the unit.

The enclosed flywheel, besides affording protection to employes against flying particles, also aids to improve engine room appearance, it being possible to paint and wipe the flywheel guard while the engine is in operation. The guard also prevents wall spotting, inside of roof and lighting fixtures, which usually occurs when the wheel is exposed and free to sling oil tangentially to its plane of revolution.



Facilities for bolting posts for this fence were made when concrete was laid.

2. FENCING

Sturdy Posts Bolted To Concrete Pad

SUPERIOR Oil Company anticipates erecting a removable fence around its wells in Kern County, and provides facilities in the concrete pad for bolting down corner and line posts.

Derricks and equipment utilized for drilling deep holes in the area are unitized and moved from one location to the next without tearing down except to separate the parts into individual units. Individual and supporting piers and structural steel posts for the derrick, draw works and floor are bolted down with foundation bolts set in the concrete when the cement is poured in the forms.

After the rig is moved and the area cleared of drilling equipment, material is assembled for the fence. Corner posts have flat plates welded on the bottom end, which rests on the thin boss above the flat concrete pad. Diagonal braces, 90° apart, are welded to the posts with a slope of 45°, having plates at the lower end with holes that fit over the derrick substructure tie-down studs in the concrete. Line posts are set on similar bosses with flat plates, each with two holes that fit the foundation bolts at that point. Wire line is stretched through holes in both the corner and line posts to complete the enclosure.

3. FOUNDATIONS

Pipe Legs Support Pumping Rig

AN ECONOMICAL method of setting pumping units and fabricating their foundations has been developed by Shell Oil Company and practiced in the Dill pool, Okfuskee County, Oklahoma.

The pit in which the concrete base of the foundation is cast is approximately 30 inches deep, I-shaped in cross section, with the shank wide enough to overlap the width of the unit base.

To the base are bolted 12 short sections of 5-inch pipe, each equipped with welded on plate

Pipe legs set in concrete are used to elevate and support this pumping rig.

THE PRODUCTION MAN . . .

This guard is ready to stop the car should the brake give while parked on a hill.

through which bolts are run for attaching to the I-beam pumping unit base.

The entire unit, with the pipe supports dangling in the pit, is supported on heavy timber cribbing at the proper elevation, and then concrete run into the pit simultaneously from two ready-mixed trucks. The base is reinforced with sucker-rod bars of the proper length, laid in as the pouring progresses.

If the base were cast solid and designed to bear directly against the I-beams of the unit, 5½ yards of concrete would be required, as against 3½ used with this method.

Using the pipe legs for supporting the unit permits setting the unit higher than customary with solid concrete bases, permitting the swinging of additional counterweights without requiring undercutting or other foundation alterations. These units are usually set with a vertical clearance of 27 inches between unit base and top of the well floor.

4. SAFETY

Simple Guard Halts Cars on Incline

SINCE many California fields are on fairly steep hills and in rough country, there is an ever-present danger of cars getting out of control while parked unattended in front of field offices and tank batteries. This is particularly true in the case of the pumpers who make the rounds continually and who park their service cars in practically the same spot at every stop along their route.

One company employs a neat and effective automobile wheel-stop, several of which are placed at several points about the lease at which cars are usually parked. A half-section of 7-inch pipe collar thread protector is welded to the rounded ends of two 2-foot lengths of 2-inch pipe. The wheel stop is buried in the earth up to the last six inches or so.

When painted white and properly maintained, these stops have proved to be just as effective as a buried log or steel fence, and are less unsightly in appearance.

5. TREATING

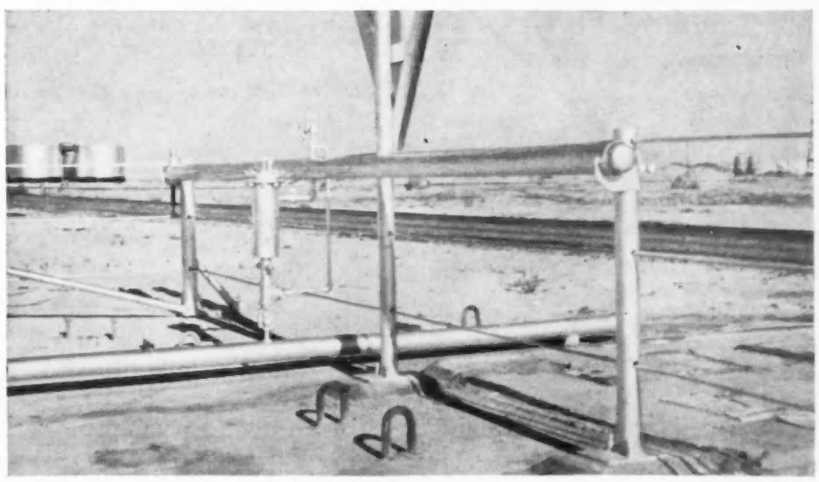
Pipe Holds Extra Chemical Supply

TO GET around the chore of frequently refilling reservoirs holding and feeding treating chemical into the flow lines at wells, Superior Oil Company, in the Rio Bravo field, Kern County, California, utilizes a horizontal joint of pipe supported on the posts, and forming a part of the well enclosure.

Brackets welded to the tops of the fence posts carry a joint of 4-inch, one end of which has a nipple and filling plug attached, with a feed line in the lower surface of the pipe to tie into the vertical reservoir of the standard feeding lubricator.

To provide venting of the horizontal reservoir, a second pipe is carried from the drop leg of the lubricator around the pipe and tapped into the top of the joint. A tee on this tie-in provides venting for both reservoir and feed line.

Since each foot of 4-inch pipe contains 0.6613 gallons of fluid, a 30-foot reservoir provides storage for 20 gallons, and permits treating chemical to be transferred from the service truck to well supply in quantities that permit efficient handling, and which justify bringing the truck to the well instead of carrying and transferring small amounts by hand.

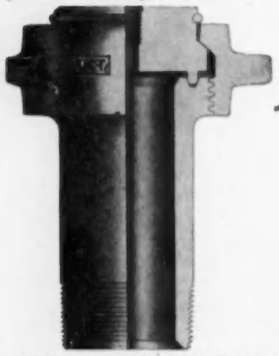


A horizontal pipe section holds a supplementary supply of the treating chemical.

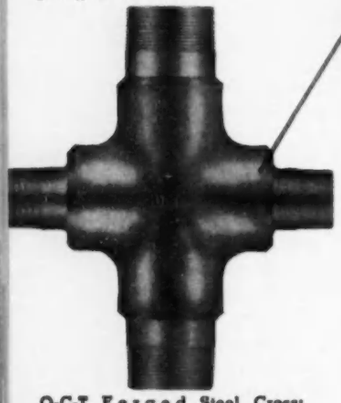
HOW *FIT* ARE YOUR *FITTINGS*

O-C-T MAKES A COMPLETE LINE OF FORGED STEEL FITTINGS AND ACCESSORIES FOR EVERY CHRISTMAS TREE NEED

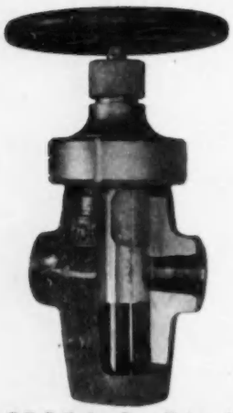
O-C-T Xmas Tree Gauges: Specially designed and scientifically constructed for accurate pressure readings.



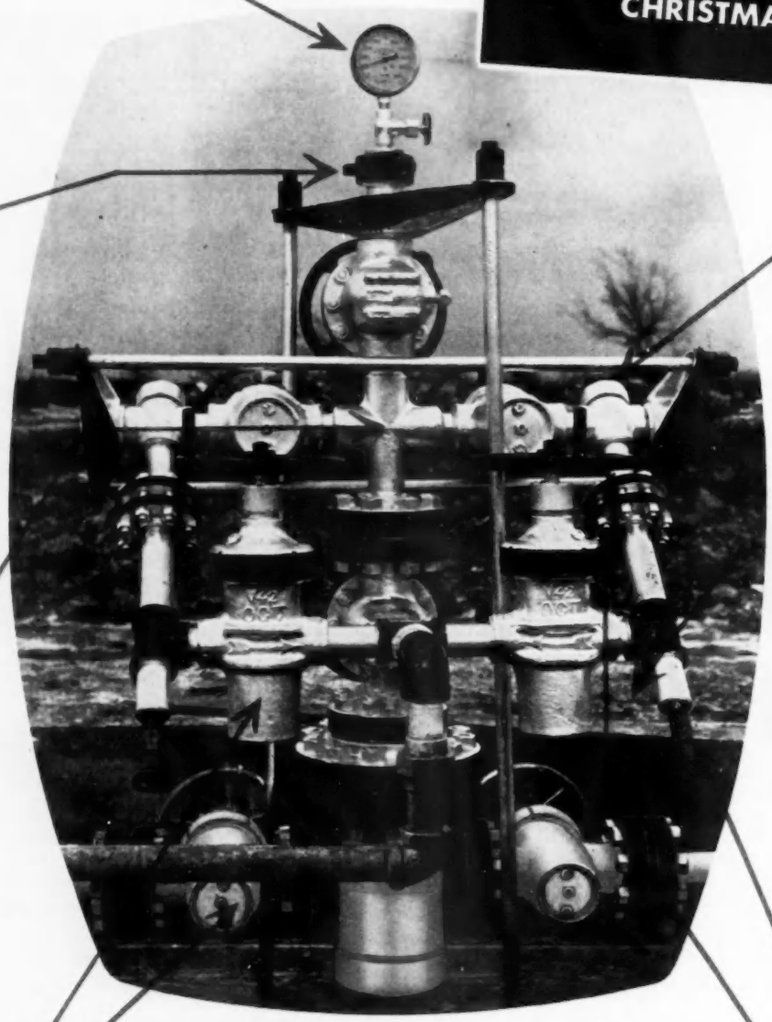
O-C-T Type B-10-A Bottom Hole Test Adapter: Eliminates bull plug on top of tree. Provides quick connection for making bottom hole tests, scraping paraffin, etc.



O-C-T Forged Steel Cross: Carefully machined from high quality steel. Inside clearance permits swabbing through. 1000 lbs. to 5000 lbs. working pressure.



O-C-T Cylinder Gate Valve: Assures a pressure tight seal under all conditions. Flanged or screwed models in working pressures from 1000 lbs. to 5000 lbs.

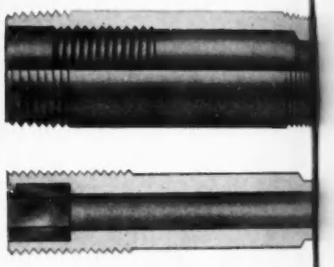


One of numerous O-C-T 6000 Lb. Test Christmas Trees in the West Ranch (Texas) field, employing the popular O-C-T Type T-26 Tubing Head.

The O-C-T line of Christmas tree fittings and accessories is complete in every detail. The fittings illustrated herewith represent only a small part of the numerous types, sizes and test pressures readily available. Threads are carefully gauged and every machined dimension must pass a rigid inspection. All fittings available either threaded or flanged.

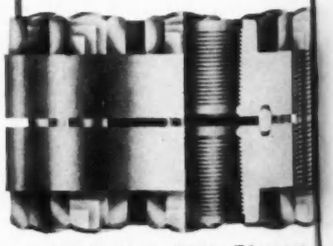
Complete mechanical details, dimensional data and prices are carried in our catalog No. 340, a copy of which will be sent to anyone upon request without obligation.

O-C-T Type FC-102 Flow Cross with Quick Change Cap: Permits rapid changing of flow beans without removing bull plug. Seal ring made integral with cap. Trapped pressure automatically released at first turn of nut.



O-C-T Type FC-140 Cage Nipple and Bean: Made of special analysis steel and accurately machined to A.P.I. specifications. Precision drilled to assure uniformity in flow.

O-C-T Type MF Pressure Gauge Needle Valve: Stem and point of stainless steel. Special asbestos stem packing.



O-C-T Type AP-11 Flange Union: Made to A.P.I. specifications in working pressures from 1000 lbs. to 7500 lbs.

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Selling Through Leading Supply Stores

HIGHLIGHTS IN THE WEEK'S NEWS

Allowables

Texas Hearing July 16 Faces Muddled Situation

The Texas Railroad Commission has scheduled its next statewide proration hearing for July 16 at Austin. This will be the first hearing held since adjournment of the legislature, and the commisison may be called upon to determine what is to be done to adjust its orders to recent court decisions.

The commission lost its case in the McElroy field, and the court fixed a minimum allowable more than twice as great as orders permitted. However, the case is on appeal, and the increase will not become effective until final judgment is entered.

Continental Oil Company received a judgment which permitted a higher allowable for the Conoco Driscoll field, and is now producing the field on the higher allowable basis.

In the Minnie Bock field, Nueces County, four wells have been granted a higher allowable by injunction and this case had not been tried on its merits. It was set for hearing July 11.

These suits arose after the commission had introduced its formula, effective March 10, which prorated each field with comparable producing conditions, on an identical basis. Prior to that time, field allowables had varied in proportion to local demands and local producing conditions.

The variations in allowable which resulted from the old system brought complaints from the less favorably situated operators, and it was to meet these complaints that the commission devised its formula and put it into effect.

A bill was introduced in the legislature which would have validated the formula by statute, but this failed to pass the Senate by one vote on the day the session closed. Attorneys are divided as to the legality of the formula under the old proration statutes, but there is every reason to believe that the commission will continue fixing allowables on the basis of the formula until a final judgment in the Texas Supreme Court holds the plan invalid.

Meanwhile, reports have reached Austin that crude oil stocks on the Gulf Coast are increasing because of the shortage of tankers. In order to offset these mounting stocks, the commission may find it necessary to reduce allowables in those fields where this oil originates.

Texas Appropriation Provides For Proration Enforcement

Under the appropriations bill approved by Governor O'Daniel last week, Texas will have $25,000 a year to contribute to the support of the Interstate Oil Compact Commission. The money will be derived from a part of the 3/16 of 1 cent tax payment received from pipe lines for the enforcement of the oil and gas regulations in the state. The money is to pay Texas' prorata portion of the expenses incurred in the maintenance of the compact and any expenditures must be approved by the governor.

The Texas Railroad Commission, for its oil and gas division, has received an appropriation of $723,000 a year, which was itemized, and in addition will get one half of the surplus funds which come in from the pipe line tax.

This will add materially to the funds available to this department for the enforcement of the conservation laws.

Decision Due Monday on Louisiana Allowable Protest

The Louisiana Department of Minerals last week heard protests of producers at a 16,000-barrel reduction in July allowable. The department said it would study the protests and announce a decision July 14.

Ask Change of Acreage Rule at Aransas Pass

The Atlantic Refining Company and other operators in the Aransas Pass field, Aransas and San Patricio Counties, Texas, have requested abolition of a commission rule which permits the assignment of non-contiguous acreage to wells for proration purposes. Under provisions of a rule entered in March, 1940, two 5-acre tracts which do not adjoin may be included in a proration unit.

The commission has recently abolished its rule in the field prohibiting the pooling of three 5-acre tracts to form a proration unit, and Atlantic insisted that the rule allowing the use of non-contiguous acreage to form a proration unit should likewise be eliminated.

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Tank Cars

Tank Car Owners Plan Speeding Shipments

A committee to perfect an association of owners and lessees of 25 or more tank cars to perfect more efficient use of the cars was named at a meeting of tank-car owners in Chicago last week.

Ralph Budd, transportation member on the Advisory Commission to the Council of National Defense, stressed the need of greater tank-car efficiency during the present emergency, and said he did not feel there was primarily a shortage in available tank cars at this time. He advocated that the owners, lessees and lessors cooperate in the move to take over as much as possible of the oil movement to alleviate the emergency situation which has arisen on the East Coast with tanker diversion.

No Plan to Regulate

He said the transportation division did not intend to regulate traffic of shippers, and that everyone would be permitted to ship products over the routes he wished, and as long as priorities of production were directed correctly it would not be necessary to have priorities for transportation. A memorandum from Oscar S. Cox, counsel for the Office of Production Management, pointed out that the government has authority to establish priority in loading tank cars on rails under the Interstate Commerce Commission Act.

Tank cars in petroleum service on January 1 are estimated at 142,500, of which 135,000 are owned by oil companies. One of the plans to be studied is speeding loading and unloading of tank cars by refiners and their customers.

Committee Named

The committee to perfect an organization met briefly following the general meeting, but withheld information on plans discussed pending official approval of the preliminary action from Washington. Members of the committee are: B. C. Graves, Union Tankcar Company, Chicago; L. H. S. Robley, North American Car Corporation, Chicago; Robert Rogers, Shippers Car Line Company, New York; H. E. Coyle, General American Transportation Corporation, Chicago; J. S. Wood, Pan American Petroleum Transportation Corporation, New York; J. E. Reardon, Union Oil Company of California, Los Angeles; C. R. Musgrave, Phillips Petroleum Company, Bartlesville; P. G. Anderson, Lion Oil Refining Company, El Dorado; Lee Cowles, Standard Oil Company (Indiana), Chicago; R. J. Walsh, The Texas Company, New York; J. J. Mahoney, Atchison, Topeka & Santa Fe Railway Company, Chicago; M. H. Mabey, Mathison Alkali Company, New York; C. R. Burwell, A. E. Staley Company, Decatur, Illinois; R. R. Luddecke, Fleischman Transportation Corporation, New York, and H. F. Sees, Commercial Solvents Company, Terre Haute, Indiana.

Pipe Lines

Michigan Gives Go-Ahead Signal to Natural Gas Project

Michigan Public Service Commission has approved applications for permission to construct 275 miles of gas transmission line, a 13-mile connector loop, and change over 66 cities from manufactured to Texas and Michigan natural gas.

Permission was extended to Panhandle Eastern Pipe Line Company and Consumers Power Company. Panhandle will build a 275-mile loop system starting at the Ohio state line and running north to Zilwaukee in one loop, and west to Kalamazoo in another loop. Lines will carry Texas gas to city gates in cities where Consumers has distribution franchise. Consumers contract provides that a minimum of 30 percent Michigan gas will be used in total take for new connections.

Panhandle officials announced right-of-way work would start at once. Cost of the pipe line, consisting of 37.9 miles 20-inch, 34.1 miles 18-inch, 32.2 miles 16-inch and 45.7 miles 12-inch, along with 10- and 8-inch pipe, is estimated at $5,000,000.

Bell Oil & Gas to Provide Fargo Outlet

Bell Oil & Gas Company, Tulsa, is buying right-of-way for a 31-mile 4-inch welded crude line to extend west from its Grandfield, Oklahoma, refinery to the Fargo 25-well pool, northwestern Wilbarger County, Texas. The line will also serve scattered oil pools in southwestern Tillman County, Oklahoma, and is to be in service within 60 days. Gravity gathering system will be employed in the Fargo field, with booster station in SE NE H&TC Section 37, southeast edge of production. Fargo operators have relied upon tank-truck shipments as an outlet since completion of the discovery well last July.

Stanolind Plans 20-Mile North Texas Line Extension

Stanolind Pipe Line Company has made preliminary survey for construction of a 20-mile 4-inch extension from the Griffin-Kadane pool, northwestern Archer County, to 4 Canyon lime pools in eastern Baylor County, Texas. The pools have 27 wells with allowable of 1100 barrels daily, largest being in Seymour area, which is connected to Shell Pipe Line Corporation's West Texas-Mid-Continent 10-inch carrier.

Stanolind Moving Texas Coast Crude Northward

Stanolind Pipe Line Company has begun crude movement north through its reworked trunk line from Mexia which hitherto has handled crude south from that point. Runs of Texas Gulf Coast oil from Fairbanks, North Houston, Roslyn and Satsuma fields, formerly served by Humble Pipe Line Company are being pumped north to Standard Oil Company of Indiana's midwestern refineries, through Stanolind direct lines. The company built eight miles of six-inch line from Aldine Junction to Fairbanks, there tying into gathering systems previously acquired from Humble.

The northbound shipments of Texas Gulf Coast crude will be alternated with East Texas oil supplied by Humble at Mexia Junction. Movement is scheduled at the rate of 15,000 barrels per day, and will remove the backlog accumulated in Mexia tankage since January 1 when reconditioning of the looped carrier from Mexia to Healdton was begun. The first 15 days of pumping northbound resulted in the handling of 123,000 barrels.

Plan Line in Arkansas

Standard Pipe Line Company has surveyed a right-of-way for a proposed line from the Magnolia, Arkansas, field to the McKamie, Arkansas, field via Dorcheat. All three fields are Smackover lime fields.

The same company has laid a line to Crescent Drilling Company's Burns 1, three miles outside the Magnolia field, Columbia County. Lion Oil Refining Company is reported negotiating for Standard's gathering system in the old Smackover field.

Mississippi Refinery Begins Operations

Paluxy Asphalt & Refining Company has placed in operation its 3000-barrel capacity crude skimming plant at Crupp, Mississippi, situated 5 miles north of the Tinsley field, and the cracking unit will go on stream later this month. Company has 5-year contract to purchase 2500 barrels of crude daily from Union Producing Company's Tinsley properties, and deliveries are made by a 4-inch line. Eugene Constantin of Dallas, Texas, is president of the refining concern, which formerly operated at Talco, Texas.

Oil for Britain

John Camp Has Plan to Donate Oil to Britain

As the result of a movement started by John Camp, independent operator of San Antonio, more than 20 operators in Texas have pledged a full day's production to be given to England, without charge, and more than a 100,000-barrel tanker cargo is ready to be delivered at a Gulf port for shipment to Great Britain. Camp is appealing for additional contributions now to make up the second cargo.

The idea developed in Camp's mind several months ago, and he immediately communicated with President Roosevelt, offering through him to England a full day's production from his own properties in Texas, the oil to come from lifting one of the present shut-down days. He offered the oil without strings as evidence of desire on the part of the oil industry to aid England. The president's response and acceptance were immediate and cordial, and the British embassy, in commenting on the idea expressed not only the deepest appreciation, but said that it would be most heartening to the English people to have this additional evidence of the generous attitude of Americans toward England.

Briefly the plan is this:

Operators in Texas have been asked to pledge one day's production, to be delivered without charge to seaboard. The president in his letter to Camp said, "I intend as soon as delivery shall have been completed, to give consideration to having this oil released, in accordance with your wishes, to the British government pursuant to Section 3 (a) (2) of the Act of March 11, 1941, commonly known as the Lend-Lease Act."

Two members of the Texas Railroad Commisison, it is reported, have signified their willingness to lift one of the present shutdown days for such operators as desire to make a contribution of that day's production to England.

Camp, a quiet spoken individual, has had very much on his mind a practical gesture of helping England. "It is particularly fitting that Texas' largest industry, the oil industry, should make this move," he said recently. Producers who are desirious of participating in filling a second tanker should communicate with him.

Labor

Drilling Contractor Wage And Hour Act Agreement

An agreement is being negotiated between Philip B. Fleming, administrator of the Wage and Hour Division, Department of Labor, and American Association of Oilwell Drilling Contractors, whereby pressure on drilling contractors will be eased until contractors can comply with the wage and hour act.

Terms of the agreement call for immediate compliance on the part of all drilling contractors. The government in return promises not to cause an inspection or investigation to be made before January 15, 1942, of any member of the industry represented by the agreement, with two or three exceptions where suits have been instituted or authorized by the administrator.

The administrator also agrees that with the two or three exceptions he will not recommend or institute legal action based solely upon violations occurring before July 15, 1941, nor will require any member of the industry represented by the agreement to make restitution of wages for any claimed violation of the act prior to July 15, 1941, unless such member be found to be in violation after July 15, 1941.

Many drilling contractors held for a time that they did not come under the provisions of the act, but the association has recommended that all drilling contractors comply with the act until its applicability to him is established by court.

The agreement was worked out after conferences between the association and Fleming. The government has shown a tendency towards leniency where past violations have not been flagrant.

Lessor Cannot Clear Texas Taxes by Paying Portion

Texas Attorney General Gerald C. Mann has ruled that the owner of an oil and gas lease may not clear the lease-hold interest of a tax lien by paying a proportionate part of the taxes assessed against the land as a whole prior to execution of the lease.

The case arose in Hidalgo County where Sun Oil Company purchased a lease in 1935, acquiring the usual 7/8 interest.

HOSE BRIGADE

production flowing!

with pride—though it can handle pressures up to 200 lb. per square inch and still insure complete protection for your crew.

And a newcomer in the production outfit is U. S. Drilling Engine Exhaust Hose—a flexible rubber hose that takes vibration shock off the drilling engine exhaust manifold, and acts as a connecting medium between engine manifold and pipe line to the pre-heater; generally used as a riser connection from the derrick floor to the pipe line on the ground. In an actual two year field test it has proved itself a product well worth your consideration. So there they are—the "U. S." Hose Brigade—ready to step in under any conditions and keep your production flowing! *For further information and prices, write*

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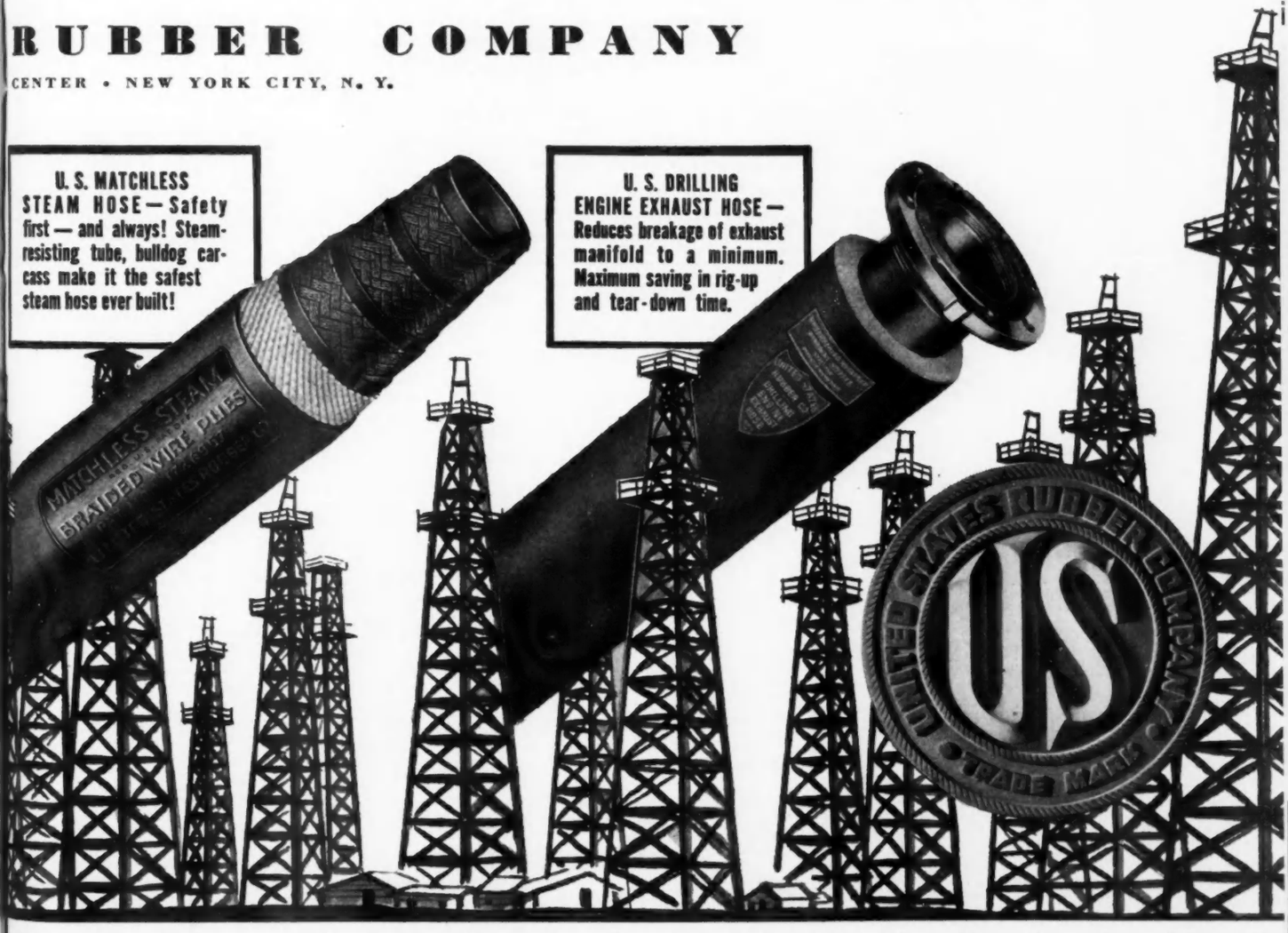
U. S. MATCHLESS STEAM HOSE—Safety first—and always! Steam-resisting tube, bulldog carcass make it the safest steam hose ever built!
U. S. DRILLING ENGINE EXHAUST HOSE—Reduces breakage of exhaust manifold to a minimum. Maximum saving in rig-up and tear-down time.
MATCHLESS STEAM
BRAIDED WIRE PLIES
UNITED STATES RUBBER COMPANY
US
TRADE MARK

AND SPECIFICATIONS

Prices of Gasoline, Lube, And Heavy Fuel Oil Rise

Markets of the oil industry, already strong previously, gained additional strength last week, as refiners and resellers found some difficulty in supplying gasoline and lubricants needed to replace the large quantities consumed during the Independence Day holiday period, while demand for heavy fuel oil also was extremely brisk, as industry and commerce returned to normal, active basis after the holiday pause.

Prices of gasoline were advanced generally ⅛-cent a gallon in the Mid-Continent refining district, and increases in the Middle West ranged from ⅛- to ¼-cent, while the Gulf Coast market was particularly strong, with the result that quotations there were generally ¼-cent higher than a week before.

Natural gasoline recovered from the sinking spell of the week before, and a ⅛-cent advance in maximum quotations canceled a mark-down of the same amount in the previous week.

Lubricants continued the gradual improvement which has been under way for several months, and prices were advanced 1 to 2 cents a gallon in Western Pennsylvania and ¼- to 1-cent in the Mid-Continent.

Bright stocks were quoted 2 cents higher by some refiners in Pennsylvania, and neutral oils were not available except for 1 cent a gallon more than in the previous week. In the Mid-Continent, bright stocks could be obtained for no less than 1 cent more than a week before, and maximum quotations were up ½-cent; while neutral oils were quoted ¼- to ¾-cent higher.

Heavy fuel oils continue generally scarce, and they now are quoted 5 to 10 cents a barrel higher than 10 days ago. No. 6 oil has been advanced 10 cents on the Atlantic seaboard by some suppliers, although minimum quotations have not changed. Bunker C fuel oil last week was quoted 5 cents a barrel higher by some refiners on the Gulf Coast, and prices of that product were in some instances 10 cents higher on the Atlantic seaboard.

Kerosene, light fuel oil and diesel oil continue in good demand, but wholesale prices last week were generally the same as a week before.

Developments in the crude oil markets last week were featured by announcement of a 20-cent advance in The Ohio Oil Company's posting for Lance Creek, Wyoming, crude, effective July 1. The price was advanced from 92 cents to $1.12 a barrel. Effective on the same date, Standard Oil Company (Indiana) discontinued its 92 cents per barrel posting for Lance Creek.

Humble Oil & Refining Company, effective July 9, established gravity-scale posting for Texas Panhandle crude.

The new Panhandle prices of the company are 3 cents a barrel above the previously paid prices of that concern, although they are the same as those initiated by The Texas Company and Sinclair Prairie Marketing Company on May 19, providing for a range up to $1.15 for crude of 40-gravity and above.

The top price now generally paid for Panhandle crude is within 3 cents of the maximum paid for sweet crude in North Texas.

Independent Pipe Line Company increased price of Falls City, Nebraska, crude 5 cents, to 85 cents. Other purchasers were expected to meet the increase.

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[2]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[1]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[2]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,273,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 9	3,584,200	3,510,000	261,631,000	[6]79,847,000	48,408,000	107,687,000
November 30	3,335,050	3,510,000	262,679,000	80,284,000	46,212,000	106,618,000
December 28	3,385,500	3,585,000	261,552,000	83,274,000	42,266,000	102,620,000
1941:						
January 25	3,599,100	3,625,000	260,093,000	88,762,000	39,039,000	100,297,000
February 22	3,629,650	3,590,000	261,783,000	95,812,000	34,381,000	98,631,000
March 1	3,632,250	3,585,000	263,176,000	96,917,000	33,725,000	97,510,000
March 29	3,746,550	3,625,000	266,187,000	[2]99,727,000	29,949,000	96,152,000
April 26	3,726,850	3,675,000	266,149,000	96,647,000	29,543,000	94,732,000
May 31	3,786,100	3,699,000	262,356,000	93,845,000	33,524,000	92,757,000
June 7	3,816,700	3,880,000	260,956,000	92,522,000	34,305,000	93,384,000
June 14	3,822,750	3,755,000	260,464,000	92,478,000	35,060,000	93,182,000
June 21	3,857,600	3,845,000	259,142,000	91,916,000	35,736,000	93,281,000
June 28	3,847,250	[1]3,930,000	259,399,000	91,461,000	35,732,000	92,896,000
July 5, 1941	3,658,200	3,745,000	.....	90,064,000	36,925,000	92,635,000
July 5, 1940	3,602,400	[8]3,535,000	[4]262,059,000	92,988,000	34,337,000	104,708,000
Change in past year	+1.5%	+5.9%	—1.0%	—3.1%	+7.5%	—11.5%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, June 29, 1940.
[5] Lowest since October, 1922, due to shut down of six Mid-Continent states. [6] Lowest for year
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California
[8] June-July, 1940, daily average.

Gasoline Shipments Decrease; Heating Oil Movement Larger

The industry carried on operations upon a normal basis during the week ended July 5, considering that the period included the Independence Day holiday, latest statistics indicated.

Refinery runs of crude slackened considerably, as in the corresponding week last year, in reflection of expected letdown of market requirements for products following the holiday period; but the runs were 6 percent larger than a year previously, an increase in line with the gain that has occurred in demand.

Gasoline production came down with the refinery throughput of crude, and a normal seasonal withdrawal of gasoline from storage occurred. Stocks of heating oil were seasonally increased, and those of heavy fuel oil were moderately reduced.

The week's figures on stocks reflected to some extent the scarcity of tanker tonnage for moving crude and products from the Gulf Coast to the Atlantic seaboard. Stocks of gasoline on the East Coast were reduced nearly 500,000 barrels more than in the like week last year, while those on the Texas Gulf Coast showed a build-up about 350,000 barrels larger than in the similar period a year ago.

That gasoline situation was attended, however, by improved movement of heating oil to the Atlantic seaboard, stocks of that product in that area having been increased 614,000 barrels, compared with an addition of only 120,000 barrels in the like week last year. Conversely, the Texas Gulf Coast stocks of light fuel oil were reduced 39,000 barrels, as compared with an accumulation of 462,000 barrels in the similar period last year.

Inventories of heavy fuel oil continue seriously small in relation to prevailing extraordinary consumption, particularly on the East Coast. The stocks in that region were reduced 329,000 barrels in the week of July 5, whereas they were increased 812,000 barrels in the corre-

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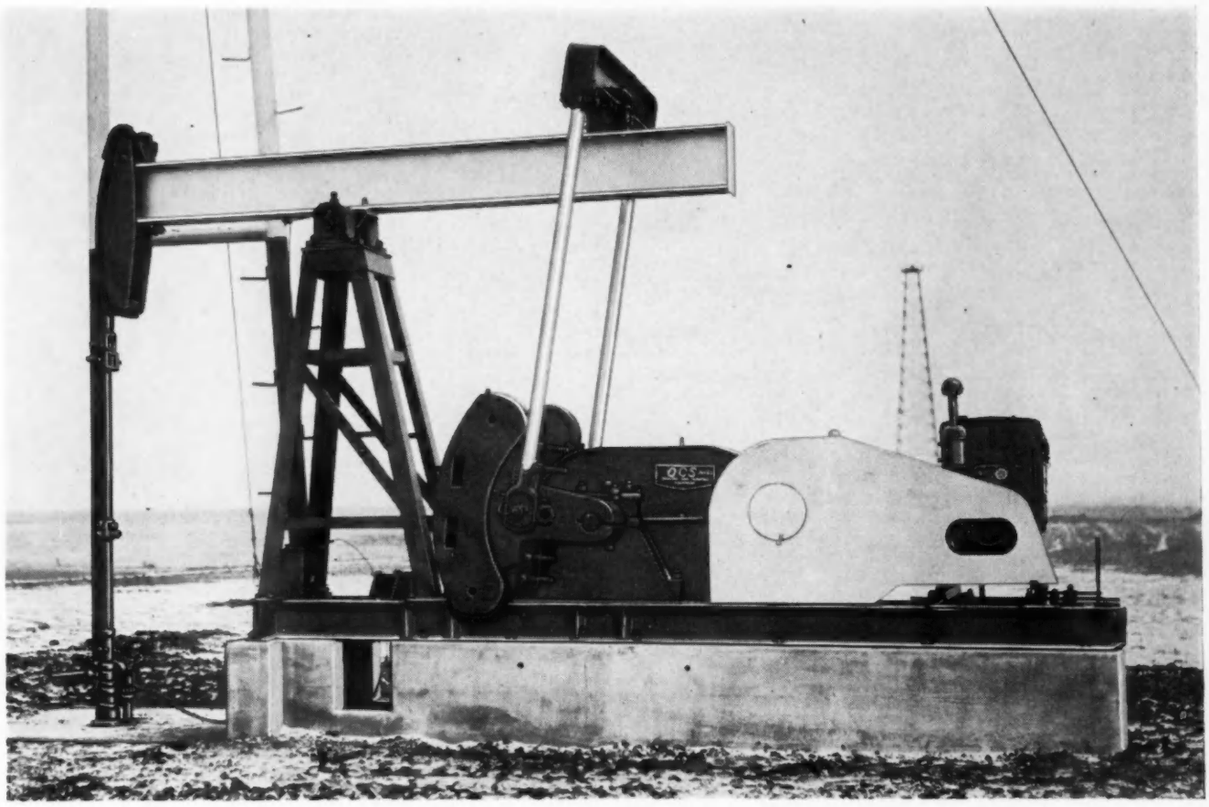

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Wholesale Prices of Refined Products in Principal Markets

REFINED GASOLINE	Range Last Week (Cents a gal.)		Changes from Week Before	
Oklahoma Refineries:				
60 Octane and under	5¼	5⅝	+⅛	+⅛
63-66 Octane	5⅝	6	+⅛	+⅛
72-74 Octane	6	6¼	+⅛	+⅛
80-82 Octane, Ethyl	6½	7¼	—	
Mid-Western Tank Car:				
60 Octane and under	5⅛	5¾	...	+⅜
63-66 Octane	5¾	6	+¼	...
72-74 Octane	6	6¼	+⅛	...
80-82 Octane, Ethyl	7⅛	7⅛	+⅛	+⅛
New York Harbor:				
68-70 Octane	8	8¼	...	+¼
72-74 Octane	8	8½	...	...
Min. 80 Octane, '39 Research	8	9	...	...
Gulf Coast:				
60 Octane unleaded	5⅛	5½	+⅛	...
65 Octane unleaded	5½	5¾	+¼	+¼
68 Octane unleaded	5¾	6	...	+¼
70 Octane unleaded	6	6	+¼	+¼
72-74 Octane leaded	6	6¼	+¼	+¼
Min. 80 Octane, '39 Research	6¼	6½	+¼	+¼
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	3⅜	3½	...	+⅛
F.O.B. Breckenr'ge, Tex.	3	3	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	4⅜	4⅜	...	...
42-44 water white	4⅛	4⅛	...	...
Mid-Western Tank Car:				
41-43 water white	4⅜	4⅜	...	...
42-44 water white	4⅛	4⅛	...	...
New York Harbor	5¼	5½	...	—¼
RANGE OIL				
At Oklahoma Refineries.	4	4⅜	...	...
In Mid-Western Market Group 3, basis	4	4	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3½	4¼	...	...
No. 2	3⅜	3⅜	...	...
Mid-Western Tank Car:				
No. 1 white	3¾	4⅛	...	...
No. 3	3¼	3½	...	...
New York Harbor:				
No. 1	5¼	5½	...	—¼
No. 3	4⅞	4⅞	...	—⅜

HEAVY FUELS	Range Last week (Per Bbl)		Changes from week Before	
Oklahoma Refineries:				
No. 6	$0.80	$0.85	...	...
Mid-Western Tank Car:				
No. 5	.85	.85	...	...
No. 6	.85	.85	...	...
New York Harbor:				
No. 5	1.65	1.75	...	...
No. 6	1.35	1.45	...	+.10
BUNKER C FUEL OIL (Per barrel, ships' bunkers)				
Gulf Coast	$ .85	$ .95	...	+.05
New York Harbor	1.35	1.45	...	+.10
DIESEL OIL (Per barrel, ships' bunkers)				
Gulf Coast	$1.55	$1.55	...	...
New York Harbor	2.00	2.00	...	...
Los Angeles Basin, 27 gravity	1.10	1.25	...	...
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	19½	20	+1	+½
Neutral oil pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	11¼	11½	+¾	+¼
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	23	25	...	+2
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	29	36	+1	...

sponding week last year. In the past six weeks, the stocks of the area have shown a net decrease of 556,000 barrels, in contrast with an addition of 1,539,000 barrels in the like period a year ago. On the Texas Gulf Coast, the stocks of heavy fuel oil increased 265,000 barrels in the week ended July 5, compared with a decrease of 83,000 barrels a year ago.

Having cut refinery runs down from the all-time peak of the week before at 3,930,000 barrels daily to 3,745,000 barrels, the industry was operating plants in the July 5 week at 87 percent of rated capacity, compared with 92 percent the week before. East Coast plants were cut down to 90 percent of capacity from 93, while other decreases included those in the Appalachian region from 99 to 95 percent.

The nation's stocks of gasoline totaled 90,064,000 barrels July 5, which was 3,000,000 barrels or 3 percent less than a year before. Aviation gasoline stocks are 2,000,000 barrels larger than a year ago and the inventories of ordinary gasoline are 5,000,000 barrels smaller.

Gasoline stocks on the East Coast now total 21,698,000 barrels, compared with 22,286,000 barrels a year ago. Within the past six weeks, they have been increased by a net amount of 541,000 barrels, while in the similar period last year they were reduced 1,332,000 barrels. In the July 5 week, the East Coast stocks were reduced, however, 1,190,000 barrels, compared with a reduction of 757,000 barrels in the like week last year.

For the United States, there has been

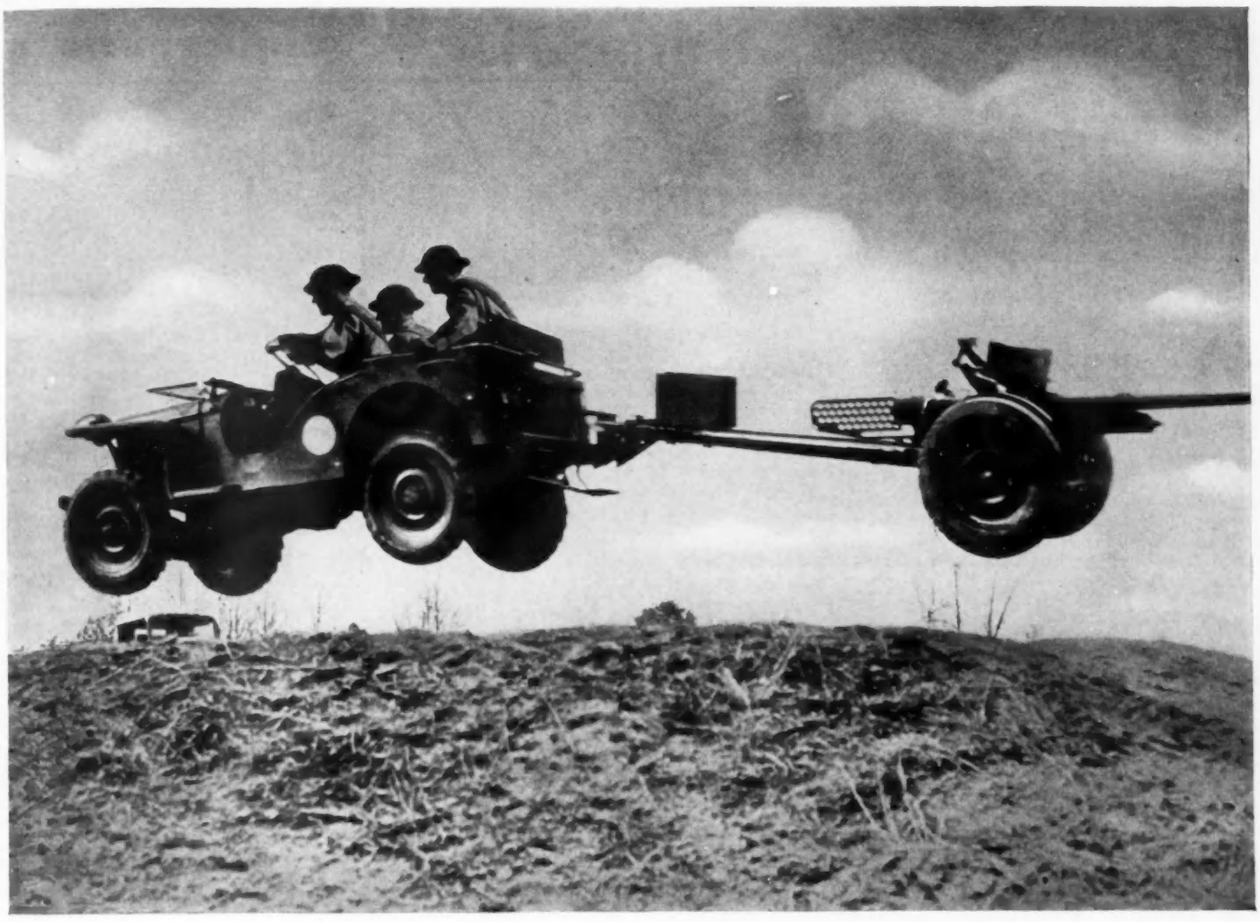
Production Rises; Texas Fields Closed Only Two Days

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (July')	State Allowable (Barrels Daily in July)	BARRELS DAILY FOR WEEK ENDED July 5	July 12
TEXAS—				
Texas Panhandle	.....	.....	83,300	83,800
North Texas	.....	.....	99,100	103,400
West Central Texas	.....	.....	29,800	31,200
West Texas	.....	.....	219,300	264,900
East Central Texas	.....	.....	76,500	84,700
East Texas Field	.....	.....	300,500	373,400
South Texas	.....	.....	177,700	213,300
Texas Gulf Coast	.....	.....	235,600	284,600
Total Texas	1,324,000	§1,300,749	1,221,800	1,439,300
CALIFORNIA				
Long Beach	.....	.....	40,700	38,000
Midway-Sunset	.....	.....	43,600	49,500
Kettleman Hills	.....	.....	40,400	36,900
Wilmington	.....	.....	79,700	80,100
Others	.....	.....	403,300	431,600
Total California	624,800	603,000*	607,700	636,100
OKLAHOMA—				
Oklahoma City	.....	.....	106,500	83,400
Seminole Area	.....	.....	108,300	109,650
Others	.....	.....	218,475	221,050
Total Oklahoma	498,500	415,000	433,275	414,100
ILLINOIS—				
Salem	.....	.....	84,500	85,700
Louden	.....	.....	58,700	61,500
Centralia	.....	.....	10,900	10,400
Other New Pools	.....	.....	176,500	175,800
Old Pools	.....	.....	11,100	11,300
Total Illinois	384,800	.....	341,700	344,700

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (July')	State Allowable (Barrels Daily in July)	BARRELS DAILY FOR WEEK ENDED July 5	July 12
LOUISIANA—				
North Louisiana	.....	.....	77,500	77,200
South Louisiana	.....	.....	238,500	240,300
Total Louisiana	304,000	303,397	316,000	317,500
KANSAS	225,300	237,400	241,100	233,800
NEW MEXICO	108,600	108,600	112,200	110,300
EASTERN STATES—				
Pennsylvania Grade	49,300	.....	74,600	72,600
Others, Eastern	52,800	.....	18,500	18,500
Total Eastern States	102,100	.....	93,100	91,100
MOUNTAIN STATES—				
Wyoming	88,400	.....	82,400	83,400
Montana	19,900	.....	19,100	19,400
Colorado	5,100	.....	3,900	4,000
Total Mountain States	113,400	.....	105,400	106,800
MICHIGAN	37,200	38,000†	38,100	39,100
INDIANA	22,200	.....	21,200	21,200
ARKANSAS	77,000	73,738	72,600	72,500
MISSISSIPPI	21,000	.....	28,800	34,500
NEBRASKA	4,200	.....	4,700	4,950
‡Total 8 Prorated States	3,199,400	3,079,894	3,042,775	3,262,700
Toral United States	3,847,100	.....	3,637,675	3,865,950

* Recommendation of Conservation Committe of California Oil Producers.
† Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.
‡ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.
§ Texas Railroad Commission's estimate of actual net daily production, allowing for usual under production of 3½ percent under net allowable, which at the beginning of July, is calculated at 1,347,926 barrels daily. However, allowable normally increases as new wells are completed. Under July order, most Texas fields were ordered shut down July 4, 5, 6, 12, 13, 16, 19, 20, 26, 27 and 31. Panhandle was ordered shut down July 5, 12, 19, 26 and 31.



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within the past six weeks a net reduction of 4,747,000 barrels in gasoline stocks, compared with a withdrawal of 7,022,000 barrels a year ago.

Light fuel oil stocks in the United States have been increasing subnormally the past two months. In the six weeks ended July 5, they were built up 3,823,000 barrels, while in the corresponding weeks last year there was an increment of 6,374,000 barrels. In the week of July 5, however, there was about the same accumulation as in the like week last year.

The lagging in accumulation of light fuel oil stocks has been especially pronounced on the East Coast, where there has been an addition of only 913,000 barrels in the past six weeks, compared with an increase of 3,303,000 barrels in the corresponding weeks last year. On the Texas Gulf Coast there has been an increase of 1,279,000 barrels in stocks, compared with a gain of only 978,000 barrels last year, indicating failure of the product to move out normally lately; although for the one week ended July 5 there was a withdrawal of 39,000 barrels from storage, compared with a 462,000-barrel addition to storage last year.

Texas Boosts Production; Mississippi Up Sharply

United States crude oil production rose during the past week, ended July 12, as Texas fields were open one day more than in the previous week, the national output having averaged 3,865,950 barrels daily. That was 228,275 barrels more than the daily production of the preceding week, and 18,850 more than the daily average market demand for domestic crude in July as estimated by the United States Bureau of Mines.

Texas fields were shut in only on July 6 and July 12, after having idled three days the week before, and production increased, therefore, to 1,439,300 barrels daily, from 1,221,800 the previous week.

World-Wide Developments

Ecuador Adds 25 Oil Wells in Five Months

From January 1 to May 31, 27 wells were completed in the Ecuadorean oil fields, 25 being producers.

Fields and the number of producers in each were: Ancon 7, Cautivo-Achallan 10, Carolina-Santa Paula 4, Concepcion 1, Tigre 3.

Production in the fields, by barrels, in the period was: Ancon 334,231, Cautivo - Achallan 40,246, Carolina - Santa Paula 22,419, Concepcion 26,309, El Tambo 376, Tigre 188,361, Petropolis 4181, Beatriz Elena 1089. Total production, 617,212 barrels, equivalent to 1,480,000 barrels yearly, is considerably below production last year, which was 2,374,439 barrels. Production has been held in, government officials report, for various reasons.

Pantepec Oil Plans Early Drilling on Amana

Pantepec Oil Company of Venezuela expects that drilling will be started on the Amana concession of 112,000 acres this year, according to the company's report to stockholders made recently by W. F. Buckley, president.

Indicated oil reserves of the El Roble concession are 247,500,000 barrels, in which the company has interest of 43¾ percent, or 108,281,250 barrels. The engineers' report that indicated these figures stated that the area that would produce ultimately and the number of producing sands might be greater than assumed in the estimate.

Pantepec began operating June 1, 1940, and between that time and the end of the year it showed net profit, after all charges, of $47,270, equal to 2 cents a share on 2,856,872 shares of capital stock, excluding 143,128 in the treasury.

Production from the Roble wells from June 1, 1940, to December 31 was 619,426 barrels, of which Pantepec's share was 270,997 barrels, and for the first five months of this year, gross production from those wells was 557,116 barrels.

The four producing wells in El Roble field on June 15 of this year were yielding 6260 barrels daily, of which Pantepec's share was 2740 barrels. Roble 4 well was put on production June 13, and now is producing 2000 barrels a day. No. 5 was spudded April 15 and No. 6 on June 22. Two drilling rigs are being used at present in developing the field.

The properties are owned jointly with Standard Oil Company of Venezuela.

Colombia Liberalizes Rule on Drilling Private Tracts

A decision by the Colombian Ministry of Mines & Petroleum upholding right of an owner of oil property acquired before 1873 to enter a drilling agreement with an oil company without government intercession is viewed as encouraging such agreements in the future.

The ministry has recognized right of Compania Petrolera Guayabito to drill on two private tracts upon the company's solicitation of permits under the law of 1873. Formerly, the ministry has not favored such permits, the recourse being long delays in the supreme court before a decision could be reached as to when property had been acquired by private individuals. To date, no drilling has occurred on private property. The ministry's recent action is viewed as clarifying and liberalizing that department's attitude.

British Equipment Orders Under Domestic Priorities

British orders for American oil-field equipment, it was declared in Washington last week, occupy the same status, relative to priorities, as domestic orders, placing Great Britain above other countries.

Orders from South American countries and China are covered by a policy of giving as much industrial aid as possible without interfering with American defense needs. Russia, with much ordered equipment tied up on American docks and in warehouses, is expected to be given the same consideration as countries other than Britian. There is no fixed rule, however, for any but British orders.

Early this month, the Office of Price Administration and Civilian Supply gave priority status to material and equipment needed for American oil production, oil and gas pipe lines and refining. The action, which included 25 other major civilian industries, was declared necessary because of heavy demands on raw materials for defense.

A further tightening of export control has developed with federal requirement that licenses be secured on all business transacted with nationals of about 30 European countries, including Spain and Portugal. It is declared by New York exporters that the re-

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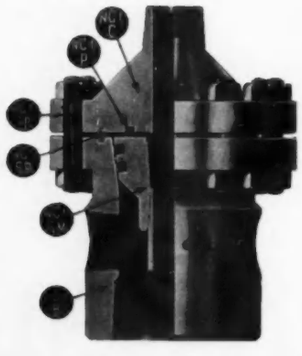

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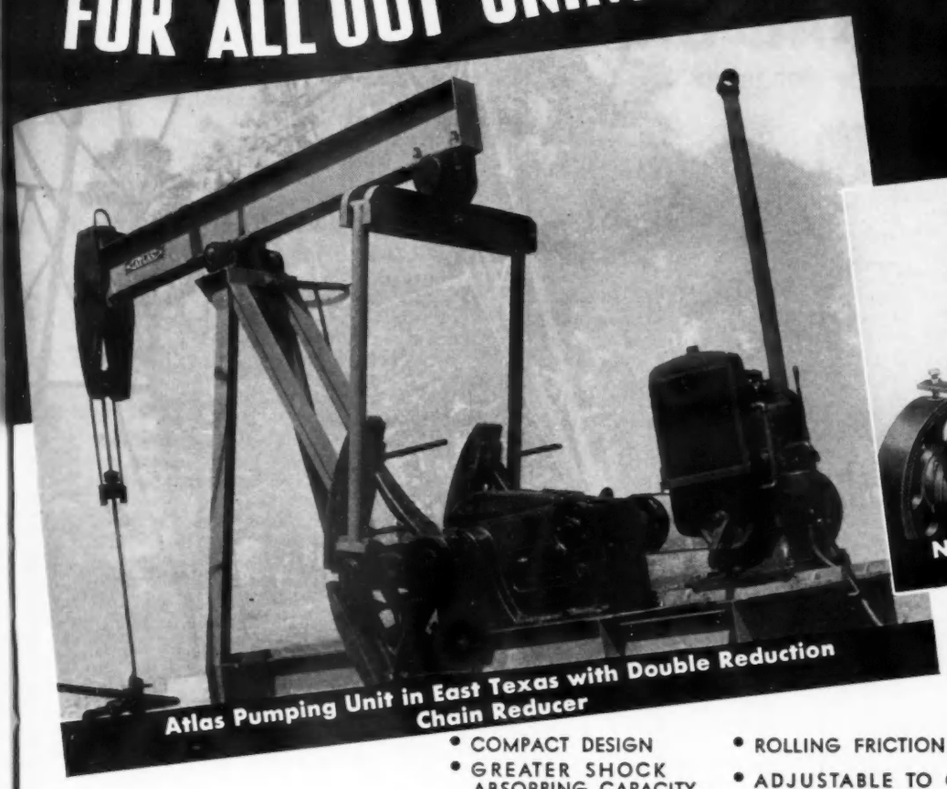

Atlas Pumping Unit in East Texas with Double Reduction Chain Reducer

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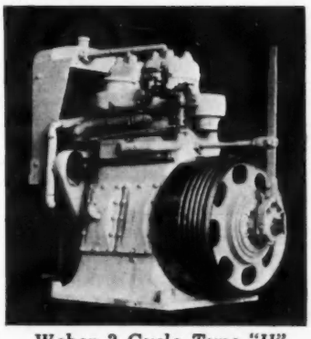
- ROLLING FRICTION
- ADJUSTABLE TO COMPENSATE WEAR
- MINIMUM REPAIR PARTS

WEBER TYPE "H" GAS ENGINE LOWERS PUMPING COSTS

Weber has built into this engine the character of design; sturdiness of construction and other features which have characterized Weber engines since 1884. A Heavy Duty Engine, especially designed for oil field service. Dependable, Low Cost, Uninterrupted Operation.

FEATURES

- *No Engine House Required*
- *Easy Starting*
- *Heavy Duty Clutch*
- *Radiator Cooling System*
- *Sets on Any Pumping Unit—No Special Base Required*
- *No Special Pulleys—Standard Bolt Rim Sheaves Used*
- *Operates on Gas, Gasoline or Butane*



Weber 2 Cycle Type "H" Engine, 2 Cylinder, 20 H.P.

Built for long life, trouble-free operation, ATLAS PUMPING UNITS are heavy duty equipment, giving maximum service with minimum of attention.

Of more compact design than others, Atlas Chain Reducers are adjustable to compensate for wear, backlash and lost motion. Chains have greater capacity to absorb shock loads. Distribution of load over large number of teeth reduces wear. Repairs, if necessary, are more economical; a single link can be replaced.

CHECK THESE FEATURES!

• *Heavy Reducer Case, Rigidly Braced.* • *Rugged Sprockets with Machine Cut Teeth.* • *Extra-Heavy Roller Chains operating in oil, inside a Dust-Proof, Oil-Tight Housing.* • *Timken Roller Bearings on all three shafts with flood lubrication.* • *Intermediate Shaft and Bearings mounted in one piece frame, which sets into machined surfaces inside the case, providing a simple, positive, and accurate adjustment. An exclusive ATLAS feature.*

BRIEF SPECIFICATIONS

Unit No.	708	808	1002	1402
Beam Rating	7416 lb	7416 lb	10222 lb	14250 lb
HP Rating	6.00	9.6	11.25	23.45
Peak Torque	30000	47768	55724	116087
Reduction Ratio	20:1	20:1	30:1	29:1
Maximum Stroke	32"	32"	44"	54"

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Condensed Statement of Condition

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AT THE CLOSE OF BUSINESS JUNE 30, 1941

RESOURCES

Cash		$19,546,369.81
U. S. Government Obligations (all carried at par or less)		19,967,839.30
Investment Bonds and Municipal Obligations (all carried at par or less)		2,443,417.92
Stock in Federal Reserve Bank		72,000.00
Loans and Discounts		5,799,964.55
Interest Earned but not Collected		79,469.08
Building Account		911,944.08
Other Real Estate Owned		1.00
TOTAL		$48,821,005.74

LIABILITIES

Capital Stock		$ 1,200,000.00
Surplus		1,200,000.00
Undivided Profits—Net		413,893.67
Reserved for Taxes, Interest, etc.		148,714.17
Interest and Discount Collected but not Earned		19,608.10
Reserved for Undeclared Dividends		96,000.00
Deposits: Commercial	$25,717,838.85	
Correspondent Banks	7,783,227.77	
Time	7,578,939.84	
Public Funds	4,352,943.72	
Other Deposits, Certified and Cashier's Checks, etc.	309,839.62	45,742,789.80
TOTAL		$48,821,005.74

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(SEE COMPOSITE CATALOG, PAGE 2523)

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quirement has seriously complicated trade with Latin countries because of difficulty in identifying nationalities of some buyers resident in those countries. Numerous business houses carry Spanish and Portuguese names. An official of one large New York firm with an export trade in oil-field equipment declared the majority of American exporters have been exercising every effort to learn names of ultimate consumers of equipment, but that some materials probably have been going to sources which the American government would prohibit from purchasing.

Penn Mex Fuel Reaches Expropriation Agreement

Conclusion of a "mutually satisfactory" agreement under which Penn Mex Fuel Company has received $300,000 in cash as full compensation for properties expropriated by the Mexican government in March, 1938, was announced last week from the Mexican embassy in Washington.

The settlement, it was said, involved acceptance by the company of the appraisal made by the experts appointed by the Mexican courts.

The agreement, signed by President Manuel Avila Comacho and his secretaries of finance and national economy, was delivered, together with the payment involved, to Col. Patrick J. Hurley, representative of the company, by the Mexican ambassador.

Rush Development of Large Canadian Gas Area

Northwestern Utilities has started development of Canada's Kinsella gas field, indicated by several widely spaced wells to be a large structure.

Among the Alberta oil fields, Turner Valley in May had 4 new rigs, 33 wells drilling, six completions and no abandonments. Other Alberta fields had eight new rigs, 13 wells drilling, two completions and three abandonments. Two Princess field wells, Princess 5 and Anglo-Steveville 3, were abandoned at 3301 and 4000 feet, respectively.

Turner Valley field in May had 194 wells producing 803,930 barrels, 99.7 percent of the entire Alberta output. Alberta production was about the same as in April, but 25 percent higher than in May, 1940.

South American Drilling

Colombian Petroleum Company's Barco concession wildcat, Socuavo 1, was being tested a few weeks ago at 8901 feet. Foundation was being built for Tres Bocas 2-A.

Texas Company of Venezuela continued testing Rincon Largo 1 at 9631 feet. On Santa Ana structure, it earlier yielded oil at 8775-90 feet. Derrick for No. 2 was ready.

Socony-Vacuum Oil Company's Anaco 1, eastern Venezuela wildcat, was drilling shale below 11,169 feet. The company's Guario 3 and 4 were drilling below 9175 and 6576 feet. Casing was set in Hamaca 1 below 3402 feet, in southwestern Anzoategui.

Abandonment of three widely scattered wildcats in Argentina has been reported by Ultramar Sociedad Petrolera Argentina. Saladillo 2, Jujuy province, was carried to 4405 feet, Cerro Lumbreras 1, Salta Province, to 1061 feet, and Piedra Clavada 1, Santa Cruz province, to 4025 feet.

U. S. FIELD OPERATIONS

Illinois Basin

Large McClosky Well Opens Wayne County Field

A Wayne County field was opened by year's most sensational wildcat; a Williamson County wildcat was waiting on cement; there was a new pay sand for Rising Sun field, White County; and prospects for Tar Springs production in Stanford township, Clay County.

Wayne County: Wiser Oil Co.'s Hillard 1, S½ SE SW 27-1n-6e, 5 miles west Cisne field, flowed 1383 bbls 11 hours, natural, McClosky 2994-96 ft after 9 casing perforations; 5½ in casing, 3-in lead line. Perforated 3021-24 ft, 15 shots, gas, no oil. Best pay 3004-12 ft, according to electrolog, yet untested, bottomed 3087 ft.

Williamson County: Arrow Drilling Co.'s Fuller 1, NW SW SE 31-8s-4e, 6 miles northeast Marion, waiting on cement 2944 ft; shows in McClosky, Renault, Benoist; Cypress, Tar Springs.

White County: Cherry et al's Karch 3, SE NE SW 24-6s-10e, swabbed 100 barrels 24 hours after shot in Palestine sand, Rising Sun field's third producing zone.

N. V. Duncan and R. B. Martin's Baker 1, NE NW NW 14-7s-8e, waiting on cement after drill-stem test Aux Vases 2885-2912 ft, oil and oily mud rose 1260 ft 40 minutes, may provide third zone Roland pool.

Clay County: Schulman Brothers' W. E. Ross 1, C N½ NW NW NW 15-3n-7e, waiting on cement to test Tar Springs topped 2314 ft, surrounded by Cypress production.

Marion County: Swan-King's Kotva Heirs 1, SW SW NW 36-4n-2e, 6 miles east East Patoka field, drilling 3650 ft, Devonian 3549 ft, may drill 3700 ft, plug back to test 12 ft Benoist 1931-43 ft. Texas Co.'s A. McClelland 1, S½ SW NE 18-2n-2e, ½ mile northwest Lake Centralia-Salem field, abandoned 3600 ft, no shows; Devonian 3497 ft.

Jefferson County: Kingwood Oil Co.'s semi-wildcat, First National Bank of Woodlawn 1, SE SE SW 35-2s-1e, swabbed 182 bbls oil natural 19 hours Benoist 1963-73 ft, swabbing continuing. Eddie Self's Minnie Zinke 1, NW SW 35-2s-1e, west offset Bank 1, location, production Woodlawn field, 3 small wells ¾ mile away. Kingwood's Sledge 1, C N½ SE SW 20-1s-4e, wildcat, drilling 1100 ft.

Scattered Wildcats: Texas Co.'s Mull 1, NW SW NW 15-6s-2w, Bond County, swabbed 3 bbls water, no oil, 1 hour, perforations Devonian 2302-10 ft, testing. Oil Carriers, Inc.'s John Wayman 1, SW NW SW 1-6s-2e, Franklin County, dry through Tar Springs, drilling to Benoist. Eason Oil Co. and Smokey Oil Co.'s Moore 1, NW SW SW 4-6s-2e, Franklin County, drilling 700 ft. Carl Bays et al's Minor Community 1, NE NE NW 28-8s-9e, Gallatin County, location. Benedum-Trees' Liles 1, SE NW SE 27-7s-4e, northeast outpost Thompsonville field, Franklin County, waiting on cement to test Rosiclare 3136-40 ft. Sinclair-Wyoming's M. L. Zellars 1, SW SW SW 26-3s-5e, northeast outpost Dahlgren field, Hamilton County, abandoned through McClosky 3343 ft. Shell Oil Co.'s Ventrees 1, SW SW SE 19-6s-5e, Hamilton County, drilling 2300. Anthony Claro's Ira Moyers 1, NE SW NW 29-11s-5e, Pope County, derrick.

Posey County Wildcat Showing in Lower O'Hara

A Posey County wildcat promised small Indiana discovery from Lower O'Hara.

Posey County: John Davis & R. B. Martin's Harlem-Wolff 1, SE SE SW 22-7s-15w, 3 miles east White County's New Haven pool, swabbed 1 bbl oil hour Lower O'Hara 2795-2800 ft after 3500 gallons acid.

A. W. Cherry & Baron Kidd's H. C. Ford 1, SE SW NW 34-4s-13w, 4 miles east New Harmony, 6 miles production, surface casing. R. B. Martin's Keck 1, SE SE NE 23-8s-15w, 3 miles east production, building derrick. Joe Dawson's J. T. Aldrich 1, SE SW SE 36-5s-15w, recementing surface casing.

Gibson County: R. D. Brown's Roberta Watts 1, SW NW SW 29-2s-12w, Montgomery Township, 2½ miles south Skelton, drilling 170 ft. Warren & Bradshaw located William Reavis 1, SW NW NW 24-2s-10w, Center Township, 1½ miles east Francisco. R. B. Sylvester spudded Earl Potts 1, SW NW SE 23-1n-10w, Washington Township, 3 miles east Hazleton.

Oklahoma

Okfuskee Wildcat Completed In Hunton for 975 Barrels

A 975-bbl Hunton producer was finaled 1½ miles northwest North Cromwell pool, Okfuskee County; new Prue pool, opened in Lincoln County; large gas strike made in Le Flore County; Otoe City pool, Noble County, extended 1 mile, and multiple producer in West Frederick pool, Tillman County, flowed 3012 bbls.

Okfuskee County: Shell Oil Co.'s Keyes "B" 1, SWc NE 22-11n-8e, northwest North Cromwell pool, 851 bbls high-gr crude 21 hours through casing, 1.1 million ft gas, perforated Hunton 4128-50 ft, 2000 gals acid; previously swabbed 420 bbls 3 hours, Cromwell and Second Wilcox uncommercial, Hunton 4090 ft, bottomed 4347 ft, plugged 4235 ft, to offset immediately.

Portable Drilling Co.'s Replogle-Johnson 1, NE SE SE 1-11n-8e, second producer Castle pool, 127 bbls 47 minutes, 3888 bbls daily, Hunton 3939 ft, bottomed 4148 ft, 1000 gals acid.

Le Flore County: Western Oklahoma Oil & Gas Co.'s Ward 1, SW NE SW NW 27-9n-24e, 8 miles west Spiro and northwest Poteau gas area, perforated 5205-50 ft, 9.0 million ft gas, shut in, base Wapanucka 5558 ft, bottomed 5795 ft, 7-in. 5795 ft. Operator spudded Bryan 1, SW NW SE 22-9n-24e.

Lincoln County: Dunnett Oil Co.'s Luckenbill 1, SW SE SE 29-15n-5e, 2 miles northwest Davenport pool, shot Prue 80 quarts 3505-50 ft, filled 2400 ft 50-gr oil, several strong head flows crude cleaning out, estimated 100 bbls daily. Same Operators Brown 1, NWc SW 17-15n-4e, 5 miles north Chandler pool, rotary drilling.

Taber & Coleman's Sumicker 1, SEc SW 32-15n-5e, semi-wildcat mile west Davenport pool, Skinner 3750-90 ft, abandoned. Logan & Cooper's Ocstmann 1, SE NE SE 11-16n-5e, Avery townsite wildcat spudded.

Tillman County: Indian Territory Illuminating Oil Co.'s Dickey 10, SE NW NW 1-3s-19w, West Frederick pool, Canyon lime 3091 ft, Arbuckle 4976 ft, bottomed 4986 ft, perforated Canyon, 226 bbls oil through annular space, 20 percent water, 2786 bbls from Arbuckle through tubing with packer, potential 3012 bbls.

Noble County: Superior Oil Corp.'s Faubian 1, SE SW SE 16-22n-1e, semi-wildcat Otoe City field, perforated 18 holes 4728-30½ ft, 10 holes 4727-31½ ft, First Wilcox 4716 ft, 180 bbls 41.2-gr 24 hours 3/16-in choke. Elm Oil Co. drilling Hicks 1, SEc SW 36-23n-2w, 3 miles southeast Billings pool.

Kansas

Thin Cherokee Section Provides Kearny County Well

A Kearny County wildcat attained production from thin sand section of Cherokee series, basal Pennsylvanian, on 200,000-ac checkerboard spread in four counties; new Lansing lime pool was opened Norton County; Krier and Kraft pools, Barton County, were extended, and new Barton County strike was made east of Pawnee Rock pool.

Kearny County: Stanolind Oil & Gas Co.'s Patterson 1, C E½ SE SE 23-22-38w, 30 miles southwest Shallow Water (Mississippi) pool, Scott County, and third attempt in Kearny County, showed 1855 ft oil 20-minute drill-stem test, sand 4740-51 ft, 1100 pounds shut in pressure after 14 minutes, 34.2-gr, bottomed 4902 ft, electrolog, set 7-in pipe on bottom to test; top anhydrite 2127 ft, Ft. Riley 2833 ft, Topeka 3680 ft, Lansing-Kansas City 4100 ft, Mississippi 4879 ft. Large spread through Kearny, Finney and Hamilton counties, Kansas, and Prowers County Colorado; thin pay section fails to enhance strike. Other companies controlling large lease spreads Magnolia Petroleum Co., Atlantic Refining Co. and Cities Service Oil Co.

Norton County: Helmerich & Payne, Inc. & Phillips Petroleum Co.'s Hewitt 1, C S½ SE NE 11-4-21w, 3 miles north Van Patton pool, 11 miles northwest Ray pool, Phillips County, elevation 2161 ft, Lansing 3402 ft, Arbuckle 3655 ft, td 3707 ft, 7-in 3401 ft, pb 3415 ft, temporary potential 70 bbls, flowed 4 bbls natural hour, 34.5-gr, preparing to acidize when water intruded, to squeeze cement.

Barton County: Helmerich & Payne's Unruh 1, C E½ NE NW 16-20-15w, 3 miles east Pawnee Rock pool, Arbuckle 3721 ft, bottomed 3739 ft, 3½ bbls oil

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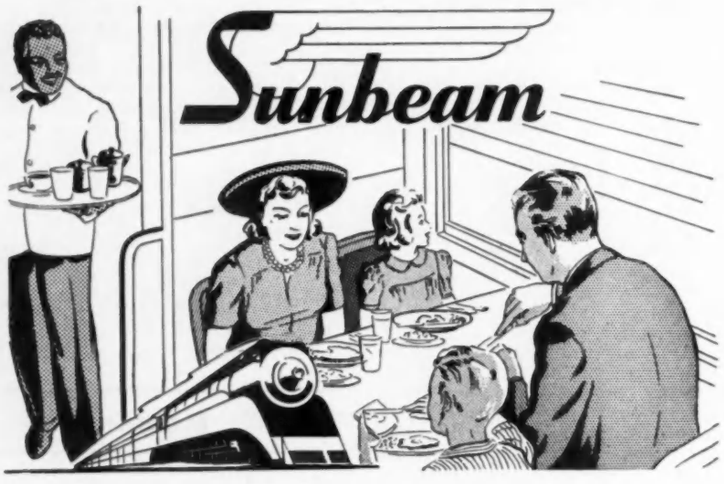

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hour, bad cement job, water intrusion, to squeeze cement. Helmerich & Payne & Phillips Petroleum Co. plugged Roth 1, C W½ NW NE 30-19-11w, west Silica pool in Ellinwood area, Lansing 3093 ft, Sooy 3351 ft, Arbuckle 3377 ft, bottomed 3404 ft.

Lauck & Moncrief's Oeser 1, SEc 25-16-12w, ¾-mile west Krier pool, Barton County, Topeka 2695 ft, bottomed 3275 ft, plugged 2972 ft, perforated 2871-85 ft, 2000 gallons acid, 311 bbls 24 hours. Phil-Han Oil Co.'s Kirmer 1, C N½ NW NW 8-17-11w, ¾-mile west Kraft pool, Barton County, Arbuckle 3368 ft, bottomed 3379 ft, swabbed 35 bbls hour 4 hours, 1767-bbl potential, 0.4 percent water.

New Mexico

Lea County Wildcat Pumps 7 Barrels Hour

Lea County wildcat qualified as commercial pumper, and oil show recorded by a prospect between Maljamar and Vacuum fields.

Wildcats: Leonard and Welch's State 1, C NW NW 18-20s-33e, 3½ miles east of Halfway pool, pumped an average of 7 bbls pipe line oil hourly on 30-hour test, sandy lime 3098-3102 ft, elevation 3523 ft. Will run 7-in oil string for completion. Richmond drilling Co.'s State-Shell 1, C SW SE 22-17s-33e, intermediate test for the Maljamar-Vacuum areas, logged show oil red sand 3759-70 ft, total depth, elevation 4146 ft. Shot 140 quarts nitro 3700-50 ft to correct crooked hole.

Lea County: Argo Oil Corp.'s State-Texaco 2-A, C SW SW 16-20s-32e, south outpost for Halfway pool, logged top pay 2667 ft and found bottom-hole water in drilling to 2669 ft. Hole is being plugged back with lead wool. Culbertson & Irwin's Wingfield-Texaco 1, 4½ miles south by west of Corbin pool, was fighting cave at 730 ft.

Vacuum: The Texas Co.'s State 10-R, C SE SW 10-18s-34e, ¼-mile south extension, flowed 54 barrels natural per hour from lime 4698 ft.

Rocky Mountain Area

Clay Basin in Utah Promises Good Gas Well

A Clay Basin test in Utah promised a large gas well, while wildcats in other areas were at interesting stages.

Clay Basin: Mountain Fuel Supply Co.'s Sparks 1, C SW SW SE 23-3n-24e, Daggett County, Utah, 17 million ft gas on drill stem, Dakota 5894 ft, bottomed 6016 ft, drilling in.

Wilson Creek: Texas Co. and California Co.'s Unit 6, NW NE SE 27-3n-94w, Rio Blanco County, Colorado, drilled Sundance 6487 ft, swabbing, scheduled for Morrison, checking high.

Bison Basin: Bison Basin Oil Co.'s Valentine Kirk 1, C NW SW 17-27n-95w, Fremont County, Wyoming, to test Sundance and Tensleep, area semi-proved for shallow Frontier gas and oil. Bison Basin along same general line of folding with Wertz and Lost Soldier, where Sundance and Tensleep are prolific.

Wyoming Anticline: K. P. M., Inc.'s State 1, NEc 36-25½n-113w, Lincoln County, running 10-in, to test Phosphoria (Ember correlative) sand showing oil, bottomed 2106 ft.

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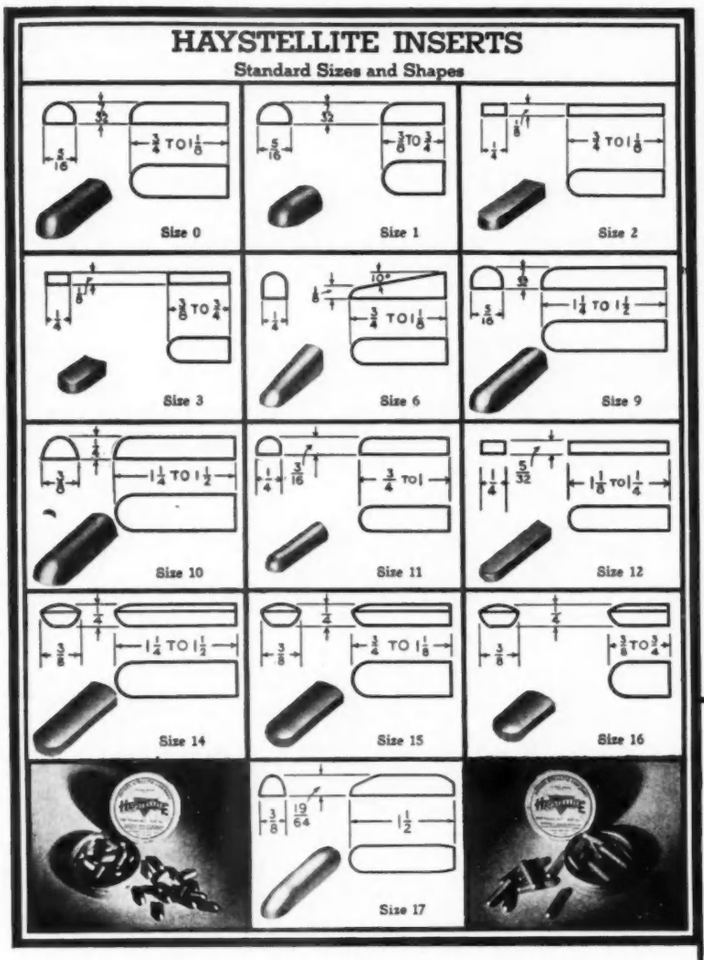

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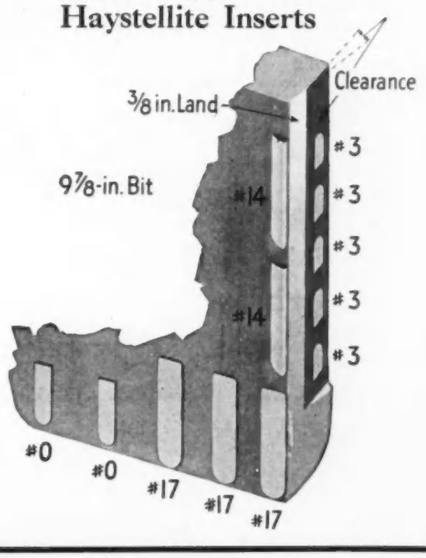

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FORT WORTH

West Texas

Good Flow From Ellenberger On South End of Sand Hills

Big oil producer from Ellenberger on south end Sand Hills field, and Ordovician pays account for more producers in Abell field, Pecos County. Latter county has shallow wildcat gas strike; and to get Delaware project by Pure Oil Co.

Sand Hills: American Liberty Oil Co. et al's Tubb 12, SE SW PSL Section 11 and northwest offset to a 9462-bbl well, flowed 2467 bbls, 2.8 percent cut, on 6-hour open-tubing gauge after acid in Ellenberger saturation 5741-57 ft, total depth 5761 ft. The well flowed 398 bbls the first hour and 446 bbls the last hour.

Farmouts: Snowden & McSweeney assigned lease on N½ NW T&P Section 17, Block 43, T-1-N, north edge production in North Cowden field by Shell Oil Co. for over-riding royalty ranging from 1/16 to ¼, and 2 tests. In Winkler County, Gulf Oil Corp. assigned Peck, Croft and G. E. Hall its lease on NW PSL Section 28, Block B-3, with former retaining ⅛ over-ride and mineral rights below 3500 ft.

Deep Wildcats: Magnolia Petroleum Co.'s Ralph 1, western Andrews County, drilling 6410 ft, and the company's Walton-State 20, between Keystone and Kermit fields, Winkler County, drilling 6530 ft. In southeastern Reagan County, Amerada Petroleum Corp.'s University 1-RA, projected Ordovician test, drilling lime and shale 8350 ft, apparently still in Permian. Texas Pacific Coal & Oil Co.-Seaboard Oil Co.'s Midland Farms 1-C, second test for southeastern Andrews County geophysical prospect, was drilling lime 4815 ft, being 45 ft low on the lime marker.

Crockett County: Amerada Petroleum Corp. et al's Todd 1-A, 4000 ft north of Crinoidal production in Todd deep pool, was coring hard dolomite at 6235 ft in Ellenberger, topped 6144 ft, elevation 2520 ft. Several swabbing tests through 5½-in at 6144 ft yielded nominal shows oil and gas, but Ellenberger lacks sufficinet porosity to produce. Todd 1-A, structurally high, is assured attractive production from broken Crinoidal saturation 5565-5895 ft. Bolsa Chica Oil Co.'s Noelke 1, wildcat 2 miles southeast Soma-Noelke pool, abandoned in salt water 1595-1638 ft, passed up several small shows oil and gas with water.

Pecos County Wildcats: Pure Oil Co.'s Fraser 1, C NW SW T&P Section 43, Block 49, Tsp. 10, 22 miles west Fort Stockton and on 16,500-ac block, starting with Delaware as objective. Humble has block southeast. H. L. Cain and Sam G. Dunn's Downs-Sun 1, 5 miles west Pecos Valley field, increased gas yield to 6,000,000 ft daily from sandy-lime 1503-06 ft, probably run 5½-in pipe before deepening.

Abell Field: Stanolind Oil & Gas Co.'s Crockett 2, southeast offset discovery, flowed 284 bbls 44-gr oil 4 hours 1½-in choke natural, broken pay 5078-5157 ft, top Tulip Creek 4920 ft. Company's Waber 1, northwest offset to big gasser in Sharp lower sand, cleaned self in pits, indicating good oil and gas yield from regular Simpson at 5317 ft, 7-in 5278 ft, and location made for Rathjen 1, C Lot 14, H&GN Section 26, Block 9, northeast outpost on expiring lease. Magnolia has 7 operations, including 4 in process of com-

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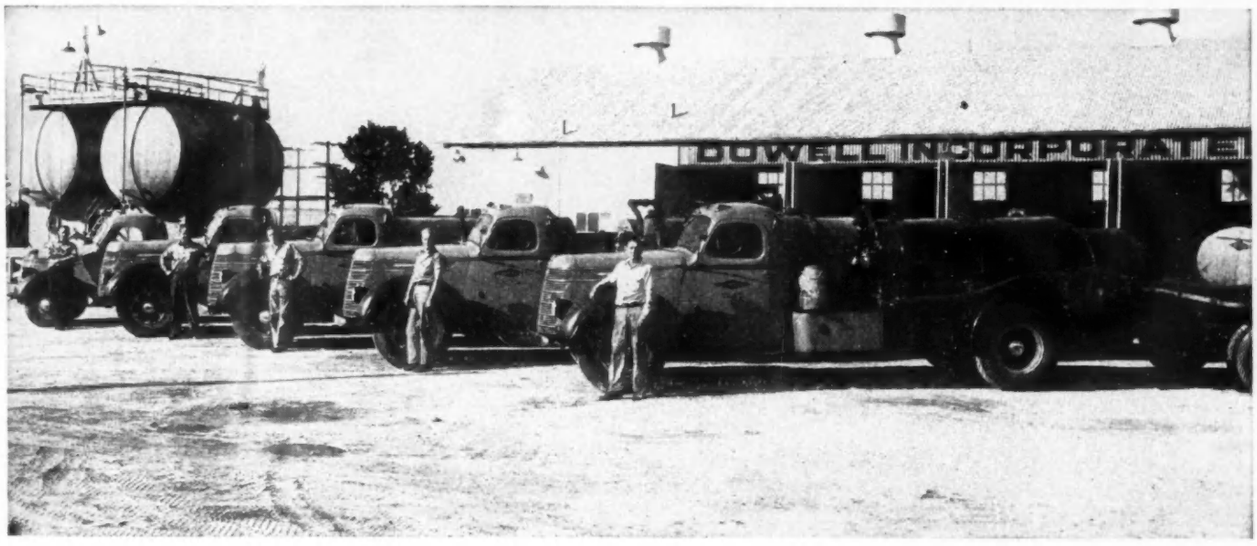

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pletion. Crockett 3, inside test, cemented 5½-in 5750 ft after showing sulphur water with trace oil and gas 5971-91 ft in Ellenberger, topped 5716 ft. Will test upper dolomite, then perforate upper Simpson. Company's McKee 1, east outpost, swabbed 81 bbls oil and 92 bbls sulphur water daily, from Lower Simpson 5914-40 ft, having used 1500 gallons acid at 1350 pounds pressure. Due to thrust fault condition thin section of Ellenberger was topped at 5808 ft, elevation 2390 ft. Two natural gas pipe line companies considering extensions into field to buy sweet gas.

Permian Discovery: Stanolind's Conry-Davis 1, northern Pecos County wildcat 4 miles southeast Abell field, flowed 246 bbls pipe line oil 13 hours, ½-in tubing choke, acidized 1000 gallons through perforations 3710-3810 ft. This prospect has been in process completion some weeks, having drilled through Ellenberger.

Eastland and Comanche Edge Tests Showing Oil Production

Shackelford County wildcat makes gasser from Strawn. Eastland and Comanche semi-wildcats showing for oil producers. Deep wildcat slated for southwestern Fisher County. South Noodle, Jones County, records prolific well.

Shackelford County: R. H. Roark et al's Elliott 1-A C SW SE L. A. L. Section 9, 6 miles northwest Moran, tested 6,650,000 ft gas in Strawn, 2879 ft, 7-in 2874 ft, elevation 1446 ft. Abundant market available for gas in general area due to owners' shallow oil properties buying gas from commercial lines for repressuring.

Eastland County: Dobbs Oil Corp.'s Hightower 1, semi-wildcat flowed oil by heads after drilling through Marble Falls lime 3251-88 ft, then plugged back from 3310 ft. To acidize with 1000 gallons. In Comanche County, O. L. Stutenrouth et al's Kirk 1, John Talbot survey, 2 miles southwest duster, testing oil and gas shows 2551-61 ft, 7-in 2536 ft. Small producer drilled some years ago to southwest.

Jones County: Humble's Huddleston 1-C southwest offset its South Noodle discovery, flowed 786 bbls 42-gravity oil initial via ½-in choke, lime 3015-20 ft, elevation 1824 ft. M. J. Delaney et al's Short-Humble 1, ½ mile northwest of Avoca production, flowed 25 bbls oil and 75 bbls water 6 hours natural from Palo Pinto 3240-45 ft, elevation 1513 ft. C. J. Kleiner et al's Jackson 1, wildcat on the Jones-Taylor County line, abandoned in salt water 2238 ft.

North Texas

Mississippian Prominent in Weeks Completion Record

The Mississippian lime recorded large oil producer in Clay County, and discoveries from this zone completed in Jack and Young Counties. Strawn oil production likely for the Scotland deep pool, eastern Archer County. First Ellenberger production indicated for South Electra shallow district.

Clay County: Shell Oil Co.'s Anderson 1, east offset to its Mississippian discovery midway between Henrietta and Bellevue, flowed 852 bbls of 47-gravity oil on 2-hour open-tubing test after acid in broken saturation 6151-6275 ft in Mississippian topped 6134 ft, 8 ft low to discovery. Prior to acidizing the well flowed 390 bbls 9 hours open tubing, then 153 bbls through ¾-in choke 3 hours. Coleman 1-A, the discovery, flowed 138 bbls natural in 3 hours ¾-in choke from perforations 6164-6283 ft last April. Company has authorized 4 additional nearby tests. Bridwell Oil Co.'s Myers 1, 6000 ft southwest of its 5776-92-ft Lower Bend oil discovery for Nebtex pool, traced oil seepage that occurred after temporarily capping surface pipe after drilling to Ellenberger 6038-65 ft to conglomerate saturation at 5778-88 ft. String of 5½-in cemented 5989 ft to be perforated.

Jack County: Alma Oil Co.'s Maxey 1, NWc W½ S. P. Section 2, A-2233, 5 miles southeast Antelope and 6½ miles south of Strawn and Mississippian production in Antelope pool, pumped and flowed 42 bbls pipe line oil 3-hour official gauge. Production from perforations 5278-5320 ft in Mississippian, topped 5255 ft, 5½-in 5287 ft.

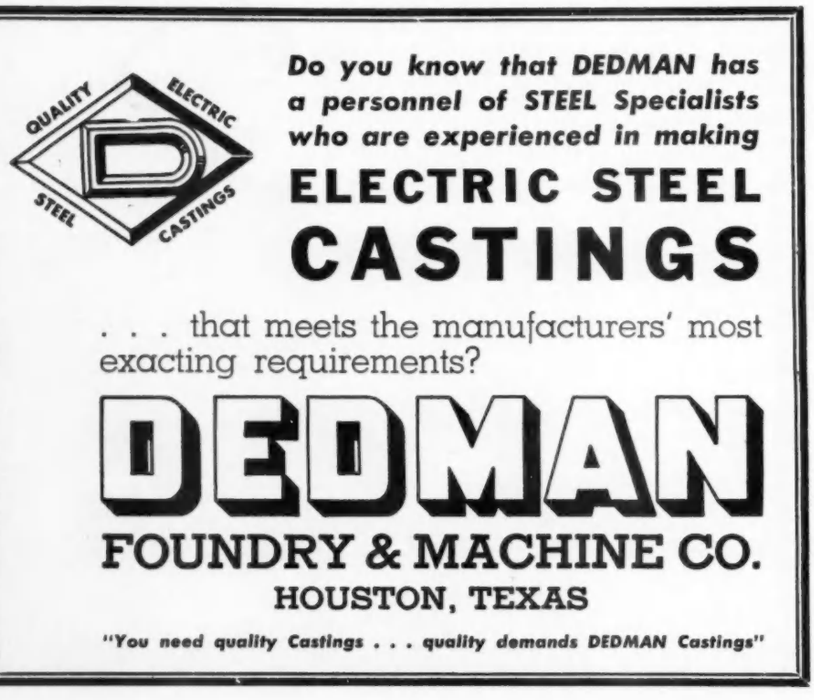
Young County: Thos. D. Humphrey et al's Williamson 1, SE NE TE&L Section 601, Crooked Creek area and ⅝-mile southeast 2900-ft pumper, flowed 112 bbls pipe line oil 3-hour gauge ¾-in tubing choke after acidizing perforations 5000-35 ft in Mississippian, topped 4980 ft. Hole plugged back from dry Ellenberger 5165-5246 ft, and water broke in when first attempt made to complete in Mississippian mid-June. Humphrey et al starting Craig 1 as east offset. R. P. Dorian & Mitchell's Daniels 1, SWc TE&L Section 421, mile east by south their Bend lime discovery for New Castle pool, cemented 7-in top Ellenberger 4920 ft to test nominal saturation 4935-45 ft. Also logged oil stain and odor in Mississippian 4756-96 ft, and in Marble Falls 4409-14 ft. Top Bend 4091 ft, 20 ft low to discovery. F. H. E. Oil Co-Fleming-Kimbell Corp.'s Graham 1, wildcat 8 miles southwest New Castle, logged shows each above zones, moving in machine to drill plugs from 7-in 4908 ft in Ellenberger, topped 4803 ft and drilled to 4927 ft.

Larimore Deep: Four wells are in process of completion in this northernmost Mississippian area for Young County. L. T. Burns et al's Allison 1, 2 locations west of their discovery, promises to be the best of the group, having flowed 140 bbls oil 4 hours, then quit. Production from broken saturation 4876-4910 ft in Mississippian, topped 4854 ft, 67 ft low to discovery. Shell's Bloodworth 1-A, north offset to discovery, is installing pump after multiple acid treatments through perforations. King Oil Co.-Phillips' Daniel 9, ½-mile west by north discovery, logged subnormal porosity in coring to 4896 ft, 5½-in 4847 ft. Test pending; top Mississippian 73 ft low to discovery. Consolidated Oil Co.-Ray Oil Co.'s Dunagan 1, mile northwest initial producer, 115 ft. low, and flows small heads oil and water after acidizing 4905-49 ft.

Archer County: Shell's Coleman 1-G, east edge Scotland 5-well Bend pool, flowed 335 bbls oil 5 hours, acidized broken lime 5024-5128 ft. Southern Petroleum Exploration's Wilson 2-A, north offset to structurally low west outpost Bend pumper, filled 1800 ft with oil from Strawn at 4020-30 ft, similar pay present in company's first well. Wilson 2-A will try upper zone.

Wilbarger County: Fargo pool development accelerated due to entry of Bell Oil & Gas Co. line. Amerada continues to use 2 contract rigs, starting operations Dodson 3 and Smith 1, west and east edge locations, respectively, and completed Harrell-Magnolia 2, NW SW NE Section 37, southeast edge, flowing natural 108 bbls 3 hours ½-in choke Basal Canyon 3924-48 ft.

Cooke County: C. H. Gannon and Harvey Drilling Co.'s Ware 1, 2½ miles northeast of Anderson-Kerr pool, opened new high-gravity oil area with initial rating 72 bbls on pump from sand 2219-27½ ft. Additional develop-



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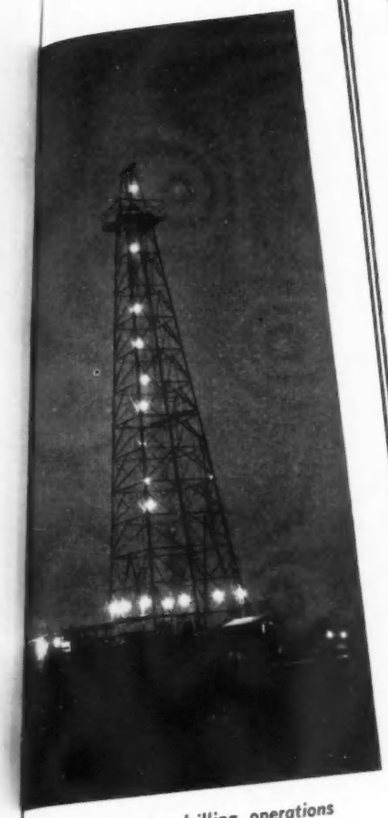
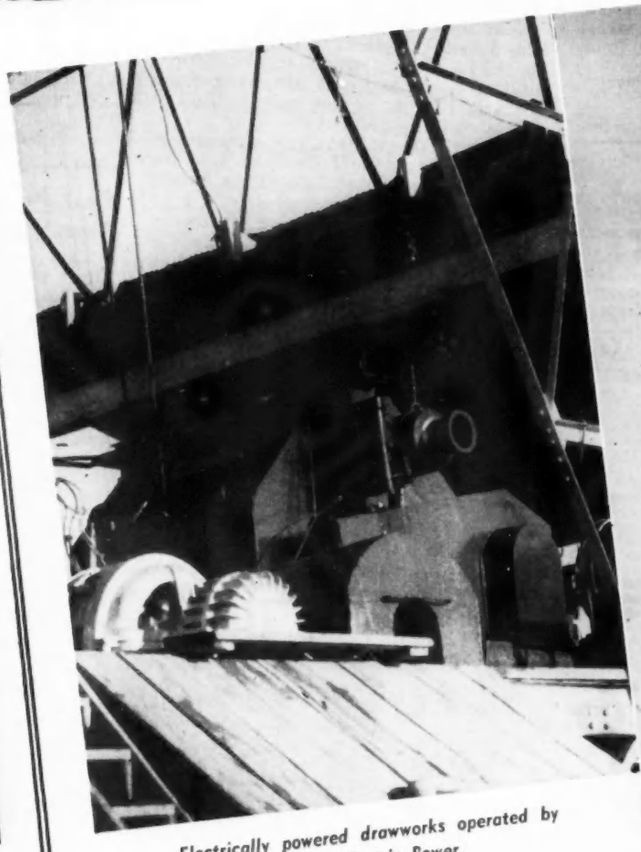


Night lighting for drilling operations furnished by central power station.



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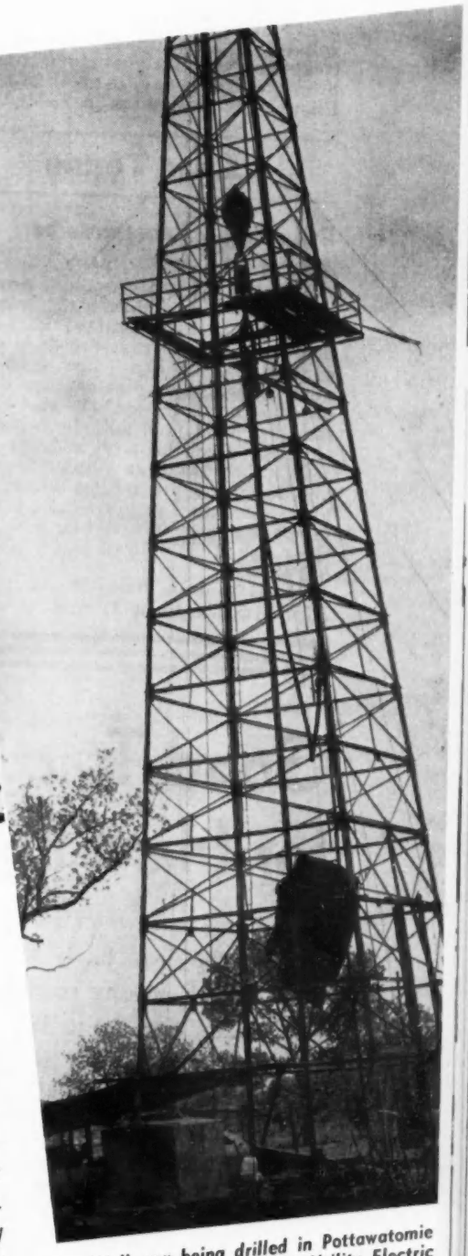

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ment projected, and prospects good for pipe line extension from Anderson-Kerr pool by Sinclair Refining Co. In Bindel pool, Sinclair-Prairie's Dangelmayr 1, second deep test, abandoned in schist 3784 ft. Topped Ellenberger 3282 ft, 32 ft low.

South Electra: Magnolia's Burnett-Gladiolus 79, SE SW HT&B Section 6, originally completed 1936 as pumper at 1934 ft, logged broken saturation 3627-35 ft in Ellenberger, topped 3627 ft. Preliminary swabbing test through 5½-in at 3625 ft, ½ bbl oil and equal volume drilling water hourly. Acid treatment will likely attain commercial production. It is 6 miles north of nearest Ellenberger production in K-M-A field.

East Texas

Woodbine Prospects at Alba and Larissa Dry

Alba and Larissa Woodbine prospects proved dry, and failure also given New Salem pool, Rush County; East Texas field recorded big pressure drop second consecutive month; Talco field given more allowable on plea national defense program needs for asphalt; east outpost Hawkins field unusually high structurally with thick beds oil and gas sands.

Cherokee County: Bobby Maziel et al's Douglas 1, second test within Humble's Larissa geophysical prospect, found water in Woodbine, and operations halted 5216 ft in shale, elevation 548 ft.

Wood County: Plains Production Co.-Al Bierman's Jones 1, wildcat in Alba townsite, abandoned in Woodbine 4425-4735 ft, elevation 458 ft.

Hawkins: Roger Lacy et al's Maberry 1, on 3.77-ac tract, northeast corner J. G. Heard Survey, assured important east extension in logging thick body gas and oil sands in topping Woodbine 4225 ft, total depth 4734 ft, casing at 4708 ft to perforate Austin chalk 4030-4101 ft, elevation 381 ft. High structural position heralds further expansion of field to east, enabling group of additional operators to participate in development.

Rusk County: Gordon Grasty et al's Kangerga 1, ½-mile northwest of New Salem discovery, low on structure, abandoned Woodbine water sand 4063-86 ft. L. O. McMillan et al acquired discovery oil and gas producer from Sears & Philips, selling gas for fuel at nearby drilling tests.

Pressure Drop: Reservoir pressure in the East Texas field declined 7.66 lbs to an all-time low of 1034.63 lbs during June, according to survey released by Texas Railroad Commission engineers. This slump follows a 5.35-lb decline the previous month, making a net reduction of 17.10 lbs for the year, although crude production during the first half of 1941 has been restricted to a total of 65,460,000 barrels, as compared to 74,245,000 barrels during same period in 1940.

Any appreciable change in the physical condition of the field is of significance at this time as there is a firm demand for this high-gravity crude, and pumping equipment is not available for the thousands of wells that will cease to flow should the reservoir pressure continue to recede.

Talco: Allowable production of the Talco field was raised from 33 to 38 barrels daily, effective July 1, on plea of purchasers that this asphalt source is needed for national defense projects. Field has been exempt from production holidays, and its 750 pumpers were yielding 24,250 bbls daily before the production hike.

Willow Springs: Humble and Gulf's Torton Dickson 2, first oil completion for the deep gas distillate field on east edge of East Texas field, flowed 60 bbls 41-gr crude initial, gas/oil ratio 28,-335/1, ½-in choke, production from Pettit perforations 7255-70 ft. Union Producing Co.'s Hays-Magnolia 1, edge test, gauged 70.0 million ft gas open flow, with 10 bbls distillate per million ft gas, Pettit perforated 7317-47 ft.

Southwest Texas

East Premont Field Gets New Sand and Extension

East Premont field in Lower Gulf Coast region received southeast extension and new sand, with another sand indicated in west extension test; Mirando district test prepared to perforate opposite slight show.

Lower Gulf Coast: Transwestern Oil Co.'s Dunlap 2, 5 to 6 bbls 41-gr oil 5/32-in choke, perforations 6090-94 ft, plugged back from 6796 ft, new sand, expands East Premont south extension 3085 ft east. Sun Oil Co.'s Andrew Canales 1, mile west production south end same field, new sand 5148-5210 ft, drill-stem recovered 1000 ft 44.5-gr oil, little mud, 84 lbs pressure 30 minutes; casing on bottom. Magnolia Petroleum Co.'s Seeligson 16 and 17 expanded production slightly north and west sides production.

Joy A, McCartney's W. V. Isham 1, new sand old Premont field, Jim Wells County, 90 bbls 23-gr oil, 4 percent water, gas lift, tubing pressure 0-75 lbs, casing 575 lbs, perforated 3706-16 ft 24 shots.

R. H. Hawn and Pan American Production Co.'s Wofford 1 expanded South Agua Dulce ½ mile south, 231 bbls 38-gr oil ⅛-in choke, 1790 lbs tubing, 1900 lbs casing, sand 7054-75 ft. Seaboard Oil Corp.'s Chapman 10, ¼-mile east discovery same ranch, Nueces County, 4300-ft sand high and gassy, coring 5850 ft.

Central Oil Co.'s A. W. Scrivener 1, 74 bbls 3/16-in choke, 1000 lbs tubing, 1050 lbs casing pressure, perforations 6076-78 ft; gas/oil ratio 10,000/1, extends 6000-ft sand Midway 2 miles southwest.

Hewitt & Dougherty's Clarkson 1, second test Refugio field, Refugio County, extension area, 96 bbls 5/32-in choke, 225 lbs tubing, 1250 lbs casing pressure, perforated 6238-43 ft, opens second sand.

Gulf Oil Corp.'s Noble 1-B, southeast outpost North McFaddin, Victoria County, oil sand 5856-64 ft; drill stem 1680 ft 37-gr pipe-line oil, good pressure, 10 minutes; casing run, promises crude production in gas-distillate area.

Wilcox Trend: Edwin J. Jones' West 3-B, 4 miles southwest George West, Live Oak County, squeeze jobs above and below 9500-ft sand for new test, bottomed 9733 ft; perf 9687-9717 ft flow 45-gr oil before salt water broke in, squeezed; new perforations 9657-77 ft,

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gas and salt water; reperforated 8982-9002 ft, base Carrizo, oil, gas and salt water 5/32-in choke, 3100 lbs working pressure.

Hewitt, Dougherty & Ogden's Weiss 1, east Tuleta in Bee County, abandoned 10,034 ft in Wilcox; several sands showed oil and distillate, too tight to complete.

Shell Oil Co.'s McManus 1, Brushy Creek, Lavaca County, reported drilling after setting 9000 ft 7-in casing, several oil showings encountered.

Mirando District: W. C. McBride's de la Garza 1, 8 miles north Bruni, Webb County, Glen sand 2335-50 ft, slight 29-gr oil show, 5½-in casing 2410 ft, total depth, will perforate 2336-44 ft, may open new field, drill stem recovered little oily mud, slight pressure.

Argo Oil Corp.'s Gonzalez 1, 10 miles northwest Premont, Duval County, milling out bit inside drill stem to test sand 6280-6308 ft, attempted blowout through drill stem, cemented.

Texas Gulf Coast

Six Wildcat Starts In As Many Counties

Wharton County wildcat has casing moved in for Frio test; six wildcats located in as many counties as activity increases.

Wharton County: Sinclair Prairie Oil Co.'s wildcat west Withers, casing to set for Frio test about 7600 ft.

New Wildcats: Pure Oil Co.'s Smith 1, 2 miles west dry hole at Manor Lake, J. E. B. Austin Survey, Brazoria County; Marrs McLean's Pickett 1, Sec. 18, Double Gum Bayou prospect, Liberty County; O. C. Garvey west of Emily Sanderson Survey, Hillister, central Tyler County, to go Wilcox 7700 ft; Glenn McCarthy's Seyle 1, John Scott Survey, Montgomery County, to drill Wilcox; Mackbank Petroleum's Armstrong 1, east Boling field, Fort Bend County, to go 8000 ft; Jasper Longmire just north Boling, Wharton County, to go 1200 ft.

Wildcat Progress: Stanolind's Hulen 1, west outpost Alta Loma, Galveston County, 5½-in liner 10,397 ft to test deep sand. Company's Doman 1, west outpost Lucky field, Matagorda County, run casing to test 9400 ft, bottomed 10,000 ft. Winston Henry's Stoesser 1, Liberty County, Cockfield sands low, abandoned 8647 ft.

Louisiana Coast

Wilcox Productive at Lower Depth in Neale Field

Prolific production in a lower Wilcox zone was found in a Neale field well.

Neale Field: Atlantic Refining Co.'s Musser-Davis Lumber Co. 5, Beauregard Parish, perforated 10,880-95 ft, 2525 ft below Wilcox top, 20 bbls 42-gr oil hour 6-hour drill stem, ¼-in choke, deepest zone tested in field.

Iberville Parish: Titanic Oil Co.'s Natalbany Lumber Co. B-3, St. Gabriel field, 237 bbls 9/64-in choke, perforated 8632-50 ft. Texas Co.'s Levey et al 1, west flank Bayou Choctaw field, electrolog showed oil 8792-8804 ft, drilling 9075 ft.

Scattered Tests: Humble Oil & Refining Co.'s Edgewood Land & Logging Co. 1, Abbie Joe district, trying loosen 7-in casing stuck 7100 ft while running to 11,541 ft. John Mayo and George H. Echols' School Land 1, Johnson Bayou prospect, electrolog, abandoned 6009 ft. Bowles & Hafner's wildcat Southwest Opelousas prospect, St. Landry Parish, surface casing 1700 ft, projected Tepetate sand or 8500 ft.

North Louisiana

Two Wildcats Located In Olla Trend Campaign

Two wildcats were staked on Olla trend for Wilcox exploration; leasing activity continued.

Wildcat Starts: Oglesby Drilling Co.'s Womack 1, SE SE 33-1n-5e, Catahoula Parish, and Grubb & Hawkins' Campbell 1, SE NE 1-11n-7e, Franklin Parish, staked on Olla trend for Wilcox exploration. J. F. Hayden will start within 120 days Urania Lumber Co. 1, in or near Sec. 4-6n-3w.

Leasing Activity: Carter Oil Co. leasing in Township 8n-4e, and Frankel Brothers Township 7n-3e, LaSalle Parish. Hassie Hunt took 5000 acres Township 20n-4w, Lincoln Parish. Union Producing Co. recorded 55,000 Morehouse Parish acres of Crosett Lumber Co. geophysical option, embracing 400,000 acres North Louisiana and South Arkansas.

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STATEMENT OF CONDITION AT THE CLOSE OF BUSINESS MONDAY, JUNE 30, 1941

RESOURCES		LIABILITIES		
Cash and Due from Banks	$ 64,624,611.41	Deposits		$157,660,278.76
U. S. Government Obligations, Direct and Fully Guaranteed	45,337,369.69	Acceptances Account of Customers and Letters of Credit		904,441.58
State, County and Other Public Bonds	11,699,866.10	Dividend Declared, Payable July 1, 1941		84,000.00
Other Bonds and Securities	922,234.11	Accrued Interest, Expenses and Reserves		403,488.23
Loans, Discounts and Acceptances	41,183,765.43	Capital	$2,800,000.00	
Customers' Liability Account of Acceptances and Letters of Credit	714,214.20	Surplus	5,700,000.00	
Stock of Federal Reserve Bank	255,000.00	Undivided Profits	2,301,443.89	
Accrued Income Receivable and Prepaid Expenses	429,410.15	Reserve for Dividend Not Declared	168,000.00	10,969,443.89
Banking House, Furniture and Fixtures	3,236,211.39			
Branch Banking Houses	920,206.32			
Other Real Estate	698,763.66			
TOTAL	$170,021,652.46	TOTAL		$170,021,652.46

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Mississippi

Tinsley Dome Production Extended South

Tinsley Dome was extended ¾-mile south, while 2-mile north outpost was staked.

Tinsley Dome: E. C. Johnson's J. O. Martin 1, NW NW 1-9n-2w, ¾-mile south production, bottomed 4847 ft in Woodruff, flowing ungauged to tanks. K. Hughes et al staked Woodruff 1, NE SW 19-11n-2w, 2 miles north production, to go 6500 ft.

Scattered Tests: British American Oil Co.'s Houston A-1, Sec. 23-11n-7w, Sharkey County, showed oil swabbing 3290 ft, to deepen. Carter Oil Co. located core test Chickasaw County wildcat block NW 29-12s-5e.

Leasing Activity—Tide Water Associated Oil Co. continued to add leases in Forrest and Covington counties. In Hinds County, Texas Co. added to holdings Sec. 35-3n-4w, now has 9000 acres; Tide Water leasing same area. Sun Oil Co. continued leasing Lawrence and Jefferson Davis counties. J. V. Lindsay and T. V. Cline took a block Township 9n-11w, supposed seismic high. J. P. Evans leased state-owned lands Townships 16 and 17n-4e, Warren County, drilling obligation six months.

Arkansas

Seventh Smackover Field Opened in Columbia County

A Columbia County wildcat provided seventh Smackover field for South Arkansas, while confirmation attempt at McKamie checked low.

Smackover: McAlester Fuel Co.'s Franks 1, C SE SE 16-18-21, 4 miles east Dorcheat, perforated Smackover 21 shots 8906-14 ft, bottomed 9020 ft, 14 bbls white distillate hour 22/64-in tubing choke; tubing pressure 2625 lbs, casing 2675 lbs; gas/oil ratio 12,000/1; shut in.

Michigan

Reed City Importance Increases With Extension

Reed City field commanded increased attention as fourth producer extended field ½-mile, flowing at record rate.

Reed City District: Weber Oil Co.'s Clark 1, SW SE NE 30-18n-10w, Osceola County, extended field ½-mile northeast with estimated natural initial 8,000-12,000 bbls day, based on hour gauges; Monroe lime 3574 ft, bottomed 3623 ft; biggest state well in 4 years, giving field minimum 1½-mile north-south productive length. Operations increased to 22, locations surveyed expected to bring 35 active rigs in 30 days; ten rotary rigs running, 3 on all-way basis, rest in combination program with cable tools from 1700 to 3600-ft completion point.

Roscommon County: Hilliard's State 1, Sec. 34-21n-3w, first county oil well, flowed 1356 bbls day choked by mastergate to maximum without blowing improvised bradenhead on 6-, 8-inch casings; came in wild from Traverse 3448 ft before producing string or control equipment had been set.

Deep Well: Prospects of logging production in Niagaran lime, topped 8271 ft, dropped as Gulf's Bateson 1, Sec. 2-14n-4e, Bay County, drilled 8500 ft in hard non-porous lime.

California

Lost Pipe Stops Deep Test Short of Drilling Record

After drilling 40 ft deeper than world's second deepest hole and coming within 400 ft of setting a record, a Buena Vista Hills test stopped on failing to recover all drill pipe on fishing job; west outpost to Del Valle area was successfully completed.

Buena Vista Hills: Honolulu Oil Corp.'s No. 25-P, Sec. 10-32-24, Kern County, bottomed 14,622 ft fine-grained hard sand, lost drill pipe, recovered to 12,883 ft, plugged 11,114 ft, to test showings up to 8500 ft by stages.

Del Valle Area: Jasper Petroleum Co.'s Videgain 1, Sec. 17-4-17, west outpost, 600 bbls 30.9-gr, cut 7 percent; 150 bbls 10/64-in choke, bottomed gray sand 6055 ft, plugged 5994 ft, water string 5883 ft.

Texas Co.'s Whitnah 1, Sec. 14-3-16, bottomed 4999 ft, plugged 3664 ft for trace oil, abandoned. Barnsdall Oil Co.'s Honor Rancho A-19-1, Sec. 7-4-16, drilling hard sand and shale 7161 ft, streaks oil sand 6780 ft.

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15,004′ Continental Oil Co., KCL No. A-2, Wasco, Kern Co., Calif., 3½″ Hydril Twinpin Joints.

14,622′ Honolulu Oil Corp., 10-25P, Buena Vista, Kern County, Calif., 4½″ and 3½″ Hydril Twinpin Joints.

14,582′ Continental Oil Co., Proctor No. 1, Washita Co., Okla., Combination string 3½″ Hydril Twinpin Joints and A.P.I. Full Hole Tool Joints.

14,051′ Continental Oil Co., KCL D-2, Strand, Kern Co., Calif., 4½″ and 3½″ Hydril Twinpin Joints.

14,018′ Superior Oil Co., Helbling No. 1, Rio Bravo, Kern Co., Calif., 4½″ and 3½″ Hydril Twinpin Joints.

13,957′ Shell Oil Co., KCL No. B-87-4, Canal, Kern County, Calif., 4½″ Hydril Twinpin Joints.

13,873′ Shell Oil Co., KCL 2-A 52-13, San Emigdio Ranch, Kern Co., Calif., 4½″ Hydril Twinpin Joints.

13,728′ Union Producing Co., Minnie Brown No. 1, Agua Dulce, Nueces County, Texas. No Hydril Joints used.

13,716′ Standard Oil Co. of California, KCL No. 8-B-1, Wasco, Kern County, Calif., 3½″ Hydril Twinpin Joints.

13,644′ Continental Oil Co., KCL No. A-3-8, Wasco, Kern County, Calif., 5-9/16″ and 3½″ Hydril Twinpin Joints.

13,610′ Superior Oil Co., Calcasieu Lake, State No. 3, Cameron Parish, Louisiana, 4½″ and 3½″ Hydril Twinpin Joints.

13,538′ Standard Oil Co. of Calif., Elrich Community No. 1, Greeley, Kern County, Calif., 4½″ Hydril Twinpin Joints.

13,409′ Fohs Oil Co., Buckley Bourg No. 1, West Dulca, Terrebonne Parish, La., 4½″ and 3½″ Hydril Twinpin Joints.

13,333′ Fohs Oil Co., State Bay Baptiste No. 1, Houma, Terrebonne Parish, La., 4½″ and 3½″ Hydril Twinpin Joints.

13,210′ Amerada Petroleum Corp., and Stanolind Oil & Gas Co., Calcasieu National Bank No. 3-B, Jefferson Parish, La., 4½″ Hydril Twinpin Joints.

13,158′ Continental Oil Company, KCL A-5-8, Wasco, Kern County, Calif., combination string ½ equipped with Hydril Twinpin Joints.

13,153′ Continental Oil Co., KCL A-4, Wasco, Kern County, Calif., 5-9/16″, 4½″, 3½″ Hydril Twinpin Joints.

13,150′ Geo. F. Getty Co., Meyer No. 2, Wasco, Kern County, Calif., 4½″ and 3½″ Hydril Twinpin Joints.

13,139′ Continental Oil Company, Meyer 1, Wasco, Kern County, Calif. No Hydril Joints.

13,139′ Standard Oil Co. of Calif., Mush Rush No. 1, Wasco, Kern Co., Calif. No Hydril Joints.

13,135′ Standard Oil Co. of Calif., KCL No. 8-B-2, Wasco, Kern County, Calif., 4½″ and 3½″ Hydril Twinpin Joints.

13,135′ Standard Oil Co. of Calif., Mush Rush No. 4, Wasco, Kern County, Calif., 4½″ Hydril Twinpin Joints.

13,131′ Geo. F. Getty Co., Jannssen No. 1, Wasco, Kern Co., Calif., 4½″ and 3½″ Hydril Twinpin Joints.

13,131′ Superior Oil Co., KCL-12, Sec. 3, Twp. 30, R. 26, Kern County, Calif., 4½″ Hydril Twinpin Joints.

13,130′ Standard Oil Co. of Calif., Mush Rush No. 5, Wasco, Kern County, Calif., 4½″ Hydril Twinpin Joints.

13,130′ Standard Oil Co. of Calif., Mush Rush No. 3, Wasco, Kern County, Calif., 4½″ Hydril Twinpin Joints.

13,124′ Standard Oil Co. of Calif., Mush Rush No. 2, Wasco, Kern County, Calif., 4½″ and 3½″ Hydril Twinpin Joints.

13,064′ Continental Oil Co. and Seaboard Oil Co., KCL C-1, Wasco, Kern County, Calif., 4½″ and 3½″ Hydril Twinpin Joints.

25 OF THE WORLD'S 28 DEEPEST WELLS

WERE DRILLED WITH PIPE EQUIPPED WITH . . .

HYDRIL TWINPIN

Trade Mark Reg.

DRILL PIPE JOINTS

DESCRIBED AND ILLUSTRATED IN THE COMPOSITE CATALOG

UNITED STATES WELL COMPLETIONS

Arkansas

Company, Well and Location	Init. Prod. Bbls.	Depth
Columbia County (Wildcat)—		
McAlester Fuel, Franks 1, 16-18-21	336	9020
Nevada County (Troy)—		
Benedum Trees, Halton 1, 11-14-20	80	2202
Union County (Urbana)—		
Marine Oil, Thompson E-9, 3-18-13	*	3367

California

Company, Well and Location	Init. Prod. Bbls.	Depth
Fresno County (Coalinga Eocene)—		
Superior, Hight 1	1483	8099
Fresno County (Coalinga Northeast)—		
Bandini Pet., No. 41-30-B	164	8293
Kern County (Buena Vista Hills)—		
Texas, Thornber A-9	10	4657
Kern County (Kern Front)—		
Westates Pet. Co., Cauley 14	30	2710
Kern County (Kern River)—		
East Puente Oil Co., No. 1	10	995
Kern County (McClung)—		
Union, KCL 31-3	*	12,396
Kern County (Midway Sunset)—		
Quality Oil Co., Cypress 6	69	1855
Kern County (Mount Poso)—		
General Pet., Heisen 6	22	1775
Ring Oil Co., Vedder 1	50	1410
Shell, Security 28	548	2071
Kern County (Mount Poso)—		
Shell, Smith 46-11	*	2443
Los Angeles County (Dominguez)—		
Shell, Reyes 117	354	4195
Los Angeles County (Potrero-Newhall)—		
Barnsdall, RSF 22	1175	7277
Los Angeles County (Wilmington)—		
A. D. Mitchell, Lagoon 1	No. Est.	3720
Morman Oil Co., Pearl 1	75	3709
Richfield, Term 1	60	3350
Union Pacific, UP E-9	922	4085
Los Angeles County (Wilmington-Torrance)—		
Wm. H. Brayton, Capital 1	110	5301
Orange County (Huntington Beach)—		
Signal, Signal-Bolsa 22-B	178	2772
Standard, Huntington A-35	104	4850
Orange County (Richfield)—		
Master Pet. Co., Thurston 1	*	4524
Santa Barbara County (Santa Maria Valley)—		
Union, Battles 3	1342	2715
Ventura County (Rincon)—		
Richfield, Hobson-US-3 (pb 4520)	137	4750
Ventura County (Shiells Canyon)—		
O. C. Field Gasoline Corp., Calumet B-4 (pb 2838)	425	2944
Ventura County (Ventura Avenue)—		
Tide Water, VL&W 37	518	6749
OLD WELLS DEEPENED		
Ventura County (Ventura Avenue)—		
Tide Water, VL&W 2 (otd) 7264)	181	8482

Illinois

Company, Well and Location	Init. Prod. Bbls.	Depth
Champaign County—		
Union Products Pet., Pirraire 1, sw nw sw 17-20n-10e	*	344
James 1, se sw se 18-20n-10e	*	342
Carson 1, n½ ne nw 19-20n-10e	*	324
Clay County—		
Shulman Bros., Gill 1, sw se sw 10-3n-7e	*	2618
Colclasure 3, se sw sw 10-3n-7e	125	2600
Edwards County—		
Superior, Kiley 2, se se se 7-2s-11e	148	3164
Effingham County—		
Carter, Reed 1, sw nw nw 18-3n-4e	89	1544
Paul Doran et al, Dasenbrock 1, nw nw se 16-8n-6e	*	2551
Fayette County—		
Carter, Durbin 6, c w½ w½ ne 4-7n-3e	42	1569
Miller 1, sw se ne 1-8n-3e	144	1530
Buzzard 1, se ne ne 3-8n-3e	318	1533
Homer Lutrell, Buzzard 1, se se ne se 34-9n-3e	92	1531
Franklin County—		
W. C. McBride, Chapman 1, se nw se 23-6s-2e	182	2095
Menhall, Rae 1, nw sw sw 24-6s-2e	240	2087
Mosely 1, se nw nw 25-6s-2e	416	2110
Moore 2, sw sw nw 25-6s-2e	250	2148
Moore 3, se nw sw 25-6s-2e	300	2170
Shell, C. W. & F. Coal 8, ne ne sw 24-6s-2e	69	2105
C. W. F. Coal "T" 4, sw sw ne 36-6s-2e	348	2145
C. W. F. Coal "RR" 8, se nw nw 36-6s-2e	325	2179
Frazier, C. W. F. Coal 2, sw ne sw 25-6s-2e	355	2158
Adkins, Chenault 3, sw ne se 25-6s-2e	157	2131
Orient Coal "R" 3, ne se ne 26-6s-2e	175	2141
C. W. F. Coal "W" 2, n½ ne nw se 36-6s-2e	296	2127
Wenger, Chenault 4, se nw se 25-6s-2e	341	2132
Pruitt et al, Minier 2, sw sw sw 30-6s-3e	78	2125
Gallatin County—		
N. V. Duncan, Leach 1, ne nw sw 15-8s-10e	272	2446
Leach 2, nw nw sw 15-8s-10e	243	2090
Leach & Halbert, Curry 6, ne sw nw 15-8s-10e	215	2080
Phillips, Egy. T & T 5, ne se ne 16-8s-10e	33	791
Hamilton County—		
Hall-Jordan, Zellars 1, sw nw sw 26-3s-5e	*	3334
Sinclair-Wyo., Hall 9, se se se 27-3s-5e	206	3334
Hall 10, sw se sw 27-3s-5e	77	3300
Friel "A" 9, sw ne se 34-5s-6e	25	3066
Texas Co., McDonald 1, nw ne se 11-6s-6e	106	3078
Clark 1, nw se nw 7-6s-7e	299	2985
Davis 5, se se nw 7-6s-7e	391	2987
Cameron Bros., Kern 2, nw se sw 7-6s-7e	500	3030
Pure Oil, Cuppy 5, ne ne nw 7-6s-7e	477	2980
Ryan Oil Co., Hunt 1, se se ne 28-6s-7e	*	3332
Jasper County—		
Pure, Cunningham 1, w½ ne ne 8-5n-10e	201	2825
Beavers 1, e½ ne ne 18-5n-10e	1130	2835
Eckl Consol. 1, ne se ne 8-6s-10e	639	2830
Jefferson County—		
Clark C. Nye, Mooney 1, sw ne ne 21-1s-2e	*	2265
Lawrence County—		
Alfred Pet. Co., Sud 1, n½ ne ne nw 29-3n-12w	28	1882
Marion County—		
Absher & Booth, McMackin 10, se sw sw 34-3n-2e	90	2037
Adams O. & G., Cox 4, nw ne se 29-4n-1e	10	1443
Shell, Clark "A" 2, ne ne se 34-4n-1e	350	1359
Moultrie County—		
Olson Dr. Co., Ekiss 1, w½ nw ne 31-14n-4e	*	2947
Randolph County—		
J. R. Rankin et al, Bierman 1, sw sw se 3-7s-5e	*	1208
Richland County—		
John Davis, Schan 1, c w½ sw nw 27-3n-9e	42	3059
Pure, Tippet 2, w½ ne ne 31-5n-10e	383	2865

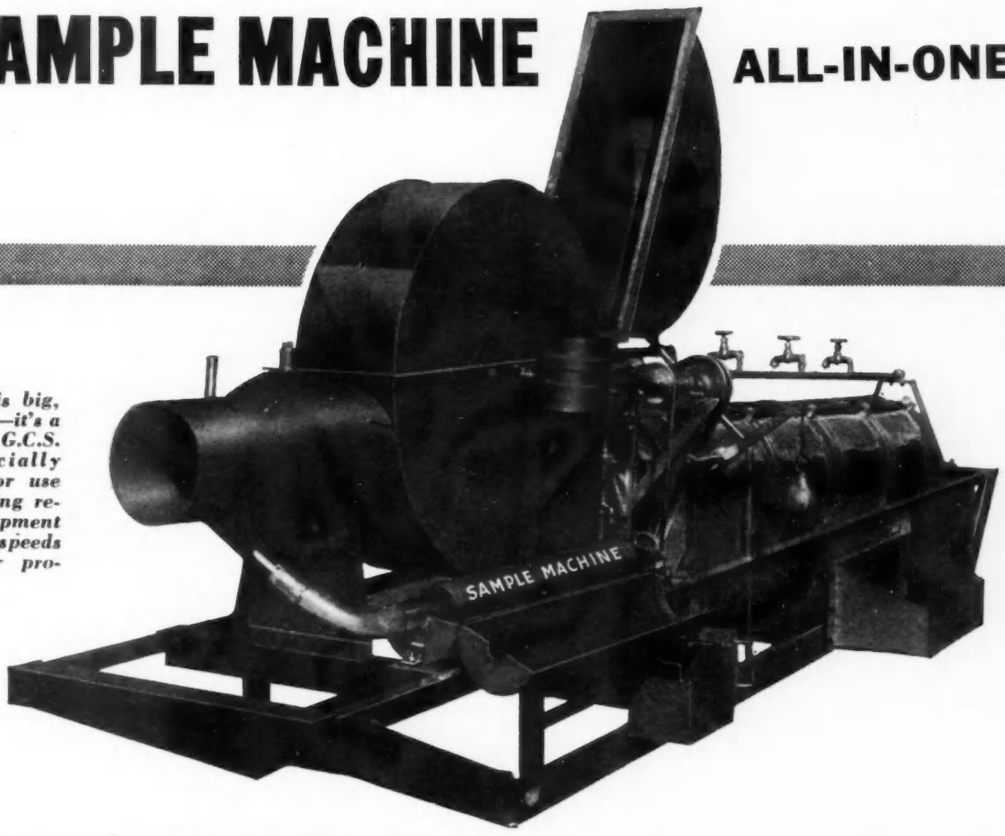
[Continued on page 172]

Summary of Drilling Operations in the United States, Week Ended July 12, 1941

	WELLS COMPLETED								*PERMITS FOR NEW WELLS				
	Total for Week	New Wells Drilled for Oil and Gas: Oil Wells	Gas Wells	Failures	†Miscellaneous	Initial Production	Total 1941	Total this Date 1940	This Week	Total this Month	Total 1941	Total this Date 1940	Year Total 1940
Alabama							1	3					
Arkansas	3	2		1		416	85	100	2	7	92	81	153
California	26	23		3		7,967	611	597	20	52	596	586	1,042
Colorado							9	3					
Florida								1					
Illinois	93	64		17	12	13,667	1,828	2,087	118	212	2,355	2,366	4,532
Indiana	20	10	1	9		2,671	279	224	11‡	21	66		
Iowa							2						
Kansas	48	32	1	11	4	41,829	1,140	1,021	59	102	1,221	1,089	2,048
Kentucky	1			1			152	166	4‡	12	33		
Louisiana	25	16	4	5		3,119	731	906	42	74	910	906	1,658
Michigan	15	6	2	6	1	10,632	423	699	20	39	440	624	1,093
Mississippi	3	3				1,488	89	109					
*Missouri							32	7		1	9		26
Montana	11	6		5		420	109	96					
*Nebraska	1			1			45	1	1	1	48		69
New Mexico	7	7				659	183	401	6	17	219	354	559
New York	28	21			7	155	443	569					
Ohio	39	9	16	14		96	866	469					
Oklahoma	49	27	3	14	5	12,349	1,093	1,192	67	127	1,143	1,009	1,888
Pennsylvania	62	44	9	3	6	64	2,004	2,077					
South Dakota								1					
Tennessee							7	8					
Texas	194	139	3	50	2	63,489	5,135	5,699	181	563	6,281	6,411	11,170
Utah								1					
West Virginia	13	5	8			39	347	292			397	782	
Wyoming	3	2		1		425	59	76			1	1	
Total this week	641	416	47	141	37	159,485	15,673	16,805	531	1,228	13,413	13,824	25,021
Total last week	607	382	41	144	40	139,729	15,032	16,187	697	697	12,882	13,391	25,021
Total this year	15,673	9,538	1,157	3,472	1,506	4,446,278							

* This tabulation includes those states where weekly data are available; figures for Missouri date from August 10, 1940; Nebraska from August 3, 1940.
‡ No data available before June 14, 1941.
† Includes old wells deepened, water-intake, gas input and salt water disposal wells.

A SHALE SEPARATOR AND A SAMPLE MACHINE ALL-IN-ONE



Look at this big, sturdy unit—it's a Thompson G.C.S. Model, specially designed for use where drilling requires equipment for higher speeds and deeper production.

Down in the Gulf Coast area a successful shale separator has to be extra speedy, rugged and dependable. That's why so many operators are using the Thompson Shale Separator and Sample Machine in this area . . . as well as in all other areas . . . it's built to do a THOROUGH and satisfactory mud reconditioning job. The heavy web-type power wheel, in the model shown above and at left, *operates the entire unit from the flow of mud* and can handle with ease the flow from a 10 inch line. Note the Sample Machine on side of unit at top. This machine, available as standard equipment, provides *true samples* of foot by foot cuttings . . . a feature which more than justifies the price of the separator. Ask us for interesting facts about the Thompson Shale Separator. It will more than pay for itself within a short time!

Manufactured by

THOMPSON TOOL CO., INC.

Sold Through Supply Stores Everywhere

Phone 3521 Iowa Park, Texas

United States Well Completions—*Continued*

ILLINOIS—Continued

St. Clair County—

Kunze, McCurdy 1, w½ se sw sw 29-3s-6w ..... * 635
Chas. Wise, Steckler 4, c e½ nw ne 33-1n-10w 15 750
Wabash County—
Paul Osborne et al, Dunkel 1, nw nw nw 6-1s-12w ..... * 2520
E. O. Olds, Hadden 1, sw nw sw 21-1s-12w 160 2033
Roberts & George, Munday 1, se se se sw 21-1s-12w ..... * 2321
W. F. Lacey et al, Sturman 2, lot 6, blk 157, 21-1s-12w 150 2063
Joe Young, Stilwell 1-A sw ne se 1-1n-12w ..... * 1460
White & Wickwire, Price 1, ne nw ne sw 14-1n-12w 42 2360
Skiles, Trimble 1, se se se se 35-2n-12w 65 1991
G. R. Hayes & Young, Trimble 1, w½ nw nw se 36-2n-12w ..... * 2020
L. B. Jackson, Freeman 2, nw se ne 36-2n-12w ..... * 1439
Washington County—
Gulf, Stanton 7, se nw nw 26-1s-1w 50 1555
Wayne County—
Pure, Elliott 3, c e½ ne sw 1-1n-7e 17 3030
Hosselton "B" 1, e½ se sw 21-2n-8e 49 2633
Duke 1, ne se sw 30-2n-3e 50 3064
Garrison 2, e½ se ne nw 31-2n-8e 179 3023
White County—
Rockhill Oil, Reeves 2, n½ nw sw ne 28-3s-14w 125 2923
H. K. Riddle, Farmers Nat'l 1, w½ sw nw 30-3s-14w ..... * 3138
Arrow Dr. Co., Hon "C" 2, se se se 32-3s-14w 728 2963
Shuler et al, Smith 2, sw se sw 5-4s-14w 60 2919
Buell & Herndon, Bond 10, sw sw ne 8-4s-14w 70 2838
Compton et al, Gray 2, se sw sw 21-4s-14w 400 2868
1st. Nat'l. Pet. Tr., Smith 1, se se sw 5-4s-14w 10 2924
Ford Hrs 4, sw ne sw 22-4s-14w 160 2867
Superior, Ford 14, ne nw se 28-4s-14w 175 2850
N. V. Duncan, Henson 2, s½ sw ne 23-6s-8e 105 2452
Fisher Oil et al, Ellis 3, ne se sw 11-7s-8e 160 2165
Lewis Prod. Co., Mitchell 2, se ne sw 11-7s-8e 125 2174
Tide Water, Baker 1, nw se se 11-7s-8e 185 2178

OLD WELLS DEEPENED

Clay County—
Kingwood, Graham 1, s½ sw ne 13-3n-6e (otd 2804) 29 2984
Coles County—
Bancroft et al, Aetna Life Ins. 1, nw sw se 7-11n-14w (otd 50).. * 863
Marion County—
Magnolia, J. R. Young 79, se se se 20-2n-2e (otd 3435) 79 4655
Shanafelt 39, se se sw 29-2n-2e (otd 3368) 45 4595
Texas Co., Denning 15, sw se se 20-2n-2e (otd 3404) 59 4627
McCollum 22, sw nw ne 32-2n-2e (otd 3385) 61 4622
Shelby County—
Moore et al, Fee 1, sw sw ne 30-10n-3e (otd 1760) ..... * 1936
Wabash County—
E. B. Hill et al, Wood 1, ne se se 21-2n-14w (otd not given) ..... * 3094
White County—
Tide Water, Bacon 1, ne se ne 5-5s-14w (otd 2746) 106 2863

GAS INPUT WELLS

Marion County—
Texas, Farthing "C" 21, e½ ne ne nw 4-1n-2e 1862
Farthing "C" 22, se nw sw ne 4-1n-2e 1888
Tate 50, se sw sw nw 5-1n-2e .. 1849
Tate 12, se nw sw ne 7-1n-2e.. .. 1855
Carr "C" 11, se nw nw 8-1n-2e .. 1868
Fyke 20, c se sw 8-1n-2e 1881
Friedrick "B" 21, se sw se ne 8-1n-2e 1882
Bryant 18, ne ne sw nw 9-1n-2e .. 1868
Friedrick RR 4, s½ nw sw 29-2n-2e 1872
Dunning 18, sw se se 30-2n-2e.. .. 1838
Stonecipher 26, s½ se sw 32-2n-2e 1891

SALT WATER DISPOSAL WELL

Marion County—
Texas Co., Stonecipher 27, w½ sw se 32-2n-2e 1385

Indiana

Daviess County—
R. D. Brown, Inc., McCracken 1, c s½ sw se 16-2n-6w ..... ¶0.6 734
J. W. Cannon, Evans 8, se se ne 8-2n-5w 18 617
Gibson County—
Yingling & Hayes, Keiffer 1, c s½ sw se 26-1s-12w ..... * 2413
Hall Edwards, Rec., Maier 40, se se sw 11-3s-14w 1000 2559
Maier 37 "C", sw ne ne 14-3s-14w 100 2875
Continental O., Bozeman Land 44, se nw sw 23-3s-14w 264 2848
Bozeman Land 39, se sw se 23-3s-14w (pb 2270) ..... * 2883
W. C. McBride, Blood 3, ne ne se 28-3s-14w 15 2892
Jay County—
A. Murray Jones, Crowe 2, w½ se nw nw 25-24n-12e ..... * 1044
Knox County—
Naomi O. & G. Co., Walden 2, c s½ ne se 261-5n-10w ..... * 150
Lake County—
Schenkel et al, Hough 1, s½ se sw ne 32-34n-7w ..... * 500
Marion County—
J. W. Adams, Snider 1, w½ sw se se 32-16n-5e ..... * 1060
Newton County—
A. C. Thomas, Henkle 1, se se se 36-30n-9w ..... * 485
Posey County—
Tide Water, Doll 9, w½ nw nw se 33-3s-14w 70 1856
Doll 11, sw nw sw se 33-3s-14w . 30 1861
Continental Oil, Kleiderer 7, sw sw ne 33-3s-14w 1032 2896
Harry Sandler, Keck 7, c w½ sw nw 34-3s-14w 15 2903
Mahutska Oil Co., Elliot 1, sw nw nw 5-4s-13w 122 2653
Spencer County—
Troy Ref. Co. et al, Grass 1, sw se ne se 11-6s-4w 5 927
Starke County—
R. J. Violette, Kanke 1, s½ sw nw se 18-32n-4w ..... * 800
Vanderburg County—
Ill.-Ind. Prod. Corp., Stratman Hrs. 1, c nw nw 14-4s-10w ..... * 2140

Kansas

Barton County—
Sinclair Prairie, Oeser 4, 2 n½ nw se 17-16-11w 66 3291
Derby, Bernstorf-Janke 5, nw sw ne 33-16-11w 3000 3346
Martin & Hearing, Feltes 3, c w½ se se 8-16-12w 3000 2878
Shell, Bitter "C" 4, sec sw 5-16-13w3000 3360
Lauck & Moncrief, Dutton-Stodder 1, c n½ nw sw 36-18-11w 123 3365
I. W. Murfin, Lanterman "C" 2, c e½ sw se 15-19-11w ..... * 3417
H. Kuhn et al, McGrevey 1, c w½ sw sw 29-20-13w ..... * 3527
Butler County—
Adair & Morgon, Sawyer 2, ne se sw 10-28-7e 740 2805
Cowley County—
Leader & Zephyr, Scott 1, nec 20-32-5e 524 3053
Elk County—
McPherson et al, Batesman 1, se sw nw 24-28-11e 15 1210
Ellis County—
Nadel & Gussman, Carmichael 4, sw ne ne 11-11-18w 3000 3443
Derby et al, Dreiling 1, c w½ sw nw 34-13-17w ..... * 3577
Ellsworth County—
Cities Service, Padlena 2, se nw se 26-14-10w ..... * 3236
Kralik 2, c w½ ne nw 8-16-10w1886 3339
Mudge, Schroeder 2, se ne ne 30-17-9w 237 3239
Greenwood County—
Reed et al, Miller 2, ne nw se 8-28-11e 10 1227
Kingman County—
Magnolia, Banta 1, c s½ se ne 26-30-5w ..... * 4774
Jefferson County—
McLaughlin & Sherrod, Bower 3, c sw ne 5-10-20e ..... ¶7.4 1501
Leavenworth County—
Longwell et al, Bankers Life 1, c nw sw 3-10-20e 60 1441
Marion County—
Sunflower Oil Co., Meyers 2, c n½ sw nw 26-17-4e 205 2407
Rex-Morris, Deban 1, c s½ sw nw 27-17-4e ..... * 2500
Holl et al, Faulkerson 1, c w½ nw nw 2-20-4e ..... * 2583
Urschell, Urschell 1, c s½ sw 16-21-5e ..... * 2330
McPherson County—
Stelbar, Union 7, c e½ ne sw 18-17-1w 1513 2679
Phillips County—
Cities Service, Nichols 1, sw nw sw 33-5-20w 2593 3601
Rice County—
Bartlett et al, Boldt 1, c s½ sw se 22-18-10w (pb 2813) 15 3225
Mabee, Miller 2, c e½ sw ne 9-20-9w 50 3254
Anderson-Prichard et al, Yeo 1, c s½ sw nw 29-20-10w ..... * 3304
Dickey, Brothers 2, c s½ sw sw 1-21-7w ..... * 3485
Russell County—
Stanolind, Booth "A" 4, c s½ ne nw 32-11-15w (pb 3225) 115 3358
Derby, Gernon 1, c w½ sw ne 20-13-15w ..... * 3311
Cities Service, Stoppel 1, nw ne sw 17-14-11w ..... * 3205
Hickey 3, c n½ ne se 25-14-14w (pb 3151) 159 3193
Major "B" 2, c e½ se se 5-15-12w 716 3220
Stearns Drl. Co. et al, Opdycke 2, c s½ se sw 20-14-13w (pb 3015) 1940 3047
J. J. Hall, Miller "D" 10, ne se ne 31-14-13w 1597 2868
Palmer, Waudby 2, c s½ ne nw 26-14-15w 1271 3186
Shell, Veji 1, nec nw 5-15-12w (pb 3230) 747 3246
Michaelis "B" 2, nwc se 33-15-13w 3000 3348
I. W. Murfin et al, Klusener 1, c w½ sw se 27-15-12w 459 3336
Coralena, Bitter 4, c s½ ne nw 16-15-13w 129 3104
Continental, Meharg 8, se ne ne 17-15-13w (pb 3126) 1510 3325
Leader Oil Co., Hinderliter 5, sec nw 33-15-13w 2864 3345
Central et al, Krug "A" 1, sec 13-15-14w ..... * 3349
Stafford County—
Stanolind, Helmers 1, c e½ nw sw 1-22-12w 3000 3575
Transwestern, McNickle 2, c s½ sw nw 1-24-11w 261 3740

OLD WELLS DEEPENED

Russell County—
Sinclair-Prairie, Brungardt 2, swc nw 31-12-15w (otd 3098) 10 3260
Stanolind, Krug "A" 1, nec 27-14-14w (otd 2988) 1821 3058
Sedgwick County—
A. J. Becker, Lennery 1, nec nw 21-25-1e (otd 2997½) 354 3348
Stafford County—
Stanolind, Richardson 8, c s½ n½ sw 10-24-11w (otd 3817) 1840 3828

Kentucky

Ohio County—
M. P. Evans, Schultz 2, 15-M-34.. * 620

South Louisiana

Cameron Parish (Wildcat)—
Stanolind's Sweet Lake 1 ..... * 9600
Cameron Parish (W. Hackberry)—
Stanolind, State 59 ..... 434 9679
Evangeline Parish (Pine Prairie)—
St. Gabriel O Co., Wexler 1 ..... 238 8230
Stanolind, Ardoin 1 ..... 272 8284
Evangeline Parish (Ville Platte)—
Continental, Vidrine Tr. 8 No. 1.. 214 10,106
Iberville Parish (St. Gabriel)—
Titanic, Natalbany B-3 ..... 237 8650
Jefferson Parish (Barataria)—
California Co., Fleming 7.....dry gas 10,800
La Fourche Parish (Chacahoula)—
Sun, Dibert-Stark-Brown A-3..... * 1330
La Fourche (Golden Meadow)—
Brownwood, Hanley 2 ..... 194 5510
La Fourche Parish (Leeville)—
Texas Co., LL&E 82 ..... 283 9732
St. Charles Parish (Paradis)—
Texas Co., LL&E 11 ..... 422 10,490
St. Martin Parish (Section 28)—
Superior, Stuart 2 ..... 260 11,302

North Louisiana

Bossier Parish (Sligo)—
Union Prod. Co., Jeter 1, 23-17n-12w .....¶85.0 5160
Caddo Parish (Pine Island)—
A. R. Hancock, Helpman 12, 16-21n-16w 15 1034
Guy N. Kinney, Crystal 5, 24-21n-16w 15 1018
L. L. Lanier, Spell 4, 12-20n-16w.. 20 1557
M. H. Marshall, Goodwin 2, 33-21n-15w 20 1590
La Salle Parish (Little Creek)—
Placid Oil Co., Goodpine B-4, 32-9n-2e 210 3730
Mills 1, 32-9n-2e 105 3714

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
La Salle Parish (Nebo)—		
Little River Oil Co., Whatley 1, 18-7n-2e	*	3724
H. L. Hunt, Goodpine A-26, 16-7n-3e	180	3765
Morehouse Parish (Wildcat)—		
Union Prod. Co., Hinkle 1, 3-21-7e	*	3000
Union Parish (Monroe)—		
N. & W. Corp., Edwards 1, 11-21n-3e	¶1.0	2173
Lankford 1, 10-21n-3e	¶1.25	2200
Winn Parish (Wildcat)—		
Nat Wissman, Quinn 1, 38-9n-6w	*	2604

Michigan

Allegan County—		
W. Spencer Cook, Sebright 1, nw sw sw 28-3n-12w	*	1696
Universal G. & O., Smith 3, ne ne nw 15-4n-13w	25	1588
Bay County—		
Basin Oil Co., Bateson 1, ne se ne 2-14n-4e	70	2858
Cass County—		
N. N. Smith, Wilhelm 1, nw sw se 12-8s-15w	*	780
Clare County—		
Sun, Thayer 1, c e½ se sw 29-20n-6w	700	3735
Goodrich 1, c w½ sw ne 32-20n-6w	32	3770
State A5, c s½ ne sw 36-20n-6w	270	3782
Gladwin County—		
Sun, Linaberry 1, se sw se 10-18n-2w	35	3851
Isabella County—		
L. & S. Dr. Co., O'Brien 1, se sw nw 20-14n-5w	¶2.0	1418
Missaukee County—		
Twin Dr. Co., Gray 1, c sw 33-23n-5w	*	995
Taggart Bros., Wonsey 23, c sw 16-21n-7w	¶2.5	1464
Montcalm County—		
Belvidere Oil Co., Jensen 1, sw nw nw, 1-11n-6w	*	1395
Osceola County—		
Weber Oil Co., Clark 1, sw se ne 30-18n-10w	9500	3623
Roscommon County—		
Sun, Hogan 3, c s½ se se 31-23n-4w	*	3721
Van Buren County—		
Sarah L. Conant, Lewis 1, nw nw ne 14-1s-15w	*	1266

Mississippi

Yazoo County (Tinsley Dome)—		
Frankel & Frankel, Twiner 1, 6-9n-2w	672	4988
Johnson Dr. Co., Stutts 3, 31-10n-2w	336	5058
C. H. Lyons, Cummings 2, 31-10n-2w	480	5055

Montana

Glacier County (Cut Bank)—		
Anderson Co., Anderson 4, ne se nw 26-35-6w	90	2854
Consolidated Gas, Frary-Tribal 2, 191, sw nw se 19-32n-5w	98	2779
Glacier Prod. Co., Lookhoff 5, sw se sw 33-33n-5w	110	2880
Van Ormer 2, c nw se 8-33n-5w	82	2840
Toole County (Kevin-Sunburst)—		
J. H. Agen, Goeddertz 16, se nw 14-35n-3w	*	1762
22-35n-3w	*	1850
Dunkirk-Advanture, McKechnie 1, Big West Oil, Carlson 1, ne ne ne nw sw se 2-31n-1w	*	1787
E. Morton, Ellingson 3, cnl ne nw 23-35n-3w	*	1724
R. G. Parrent, Holbrook 1, c sw ne 2-36n-3w	20	2065
Ramona Oil Co., Government 4, ne ne nw 12-35n-3w	*	1808
Superior Oil Corp., Haugen 4, se ne ne 11-35n-3w	20	1583

Nebraska

Memaha County—		
Kees et al, Kiechel 1, sec 4-5n-13e	*	2425

New Mexico

Eddy County—		
V. L. Arnold et al, Arnold 2-B, nw ne nw 34-17s-30e	22	3281
J. N. Elder et al, Root 3, c nw nw 12-17s-29e	37	2752
Red Lake Oil Co., Williams 2, swc nw 21-17s-28e	45	2023
R. R. Woolley et al, Fee 4-D, sw se nw 31-17s-30e	43	3018
Lea County (Lovington)—		
Fred Turner Jr. et al, Webb 1, sw se nw 31-16s-37e	66	4990
Lea County (Maljamar)—		
Carper Dr. Co., Simon 6-N, c se se 29-17s-32e	350	4013
Lea County (Rhodes)—		
Krupp-Flaherty Oil Co., Moberly 3-B, c ne sw 21-26s-37e	96	3298

New York

Allegany County—		
Vosburg Oil Co., Green Farm, Bolivar	8	1421
Chas. J. Reeland, Rowley farm, Bolivar	20	1079
Glen Williams, Williams farm, Bolivar	5	1248
Mountain Oil Co., Kilbury farm, Bolivar	7	1439
E. G. William et al, Mattock farm, Wirt	9	1372
Messer Oil Co., Miles farm, Bolivar	8	1453
Richardson Pet. Corp., Holtom farm, Scio	10	1173
N. V. V. Franchot, Emerson farm, Scio	6	1276
Porge Oil Co., Reid farm, Alma	7	1384
Bradley Prod. Corp., Duke farm, Alma	5	1529
N. V. V. Franchot, Reddy farm, Alma	8	1446
Albert Oil Co., Coats farm, Alma	6	1268
Marsh Oil Co., Austin farm, Greenwood	8	1332
Scio O. & G. Co., Fuller farm, Scio	6	860
Sloan & Zook, McDivitt farm, Bolivar	8	1384
Forest Oil Co., Ackerman farm, Bolivar	10	1390
George Sharpe, Potter farm, Amity	3	759
Jacob Trenkle, Childs farm, Clarksville	5	1369
New York Oil Co., Brown farm, Bolivar	6	1348

[*Continued on next page*]

"22 Years of Oil Field Service"

MOST COMPLETE LEASE CONSTRUCTION AND MAINTENANCE SERVICE

FIELD OFFICES:

Location	Phone
Carmi, Ill.	435R2
Salem, Ill.	463
St. Elmo, Ill.	48R
Falls City, Nebr.	59
Great Bend, Kan.	728
Seminole, Okla.	83
Wichita Falls, Tex.	8555
Hamlin, Texas	58
Abilene, Texas	—
Pampa, Texas	463
Seminole, Texas	150
Sundown, Texas	142
Imperial, Texas	1
Odessa, Texas	615
Hobbs, New Mexico	363

LUMBER YARDS

Shidler, Okla.	53
Borger, Texas	115
Denver City, Texas	43
Hamlin, Texas	58
Imperial, Texas	1
Monahans, Texas	185
Kermit, Texas	27
Odessa, Texas	615
Pampa, Texas	257
Seminole, Texas	150
Skellytown, Texas	L.D.
Sundown, Texas	142
Sunray, Texas	28
Eunice, N. M.	6
Hobbs, N. M.	139
Jal, N. M.	21
Carmi, Illinois	321
Grayville, Illinois	194
Salem, Illinois	463
St. Elmo, Illinois	108
Griffin, Indiana	13

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General Offices:
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TULSA, OKLAHOMA

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
NEW YORK—Continued		
Gordon Smith, Lot 8, Genesee	4	1281
Willetts & Paul Corp., Willetts farm, Genesee	6	1446
WATER INTAKE WELLS		
Allegany County—		
Bradley Prod. Corp., Bascom farm, Alma	..	1376
Brothers Oil Co., Crandall farm, Bolivar	..	1381
Wm. Taylor Est., Reid farm, Alma	..	1415
J. P. Herrick, Howe farm, Bolivar	..	1389
L. H. Thornton, et al, Fassett farm, Alma	..	1284
Hopkins, Short Bros. et al, Clark farm, Independence	..	1269
Bliven Hill Oil Co., McEwen-Norton Scio	..	961

Ohio

Company, Well and Location	Init. Prod. Bbls.	Depth
Allen County—		
Old Fort Oil Co., Rumbaugh 7	5	1377
Ashland County—		
Perry Oil, DeVault 1	5	716
W. G. Obrecht, Galloway 4	¶0.15	725
Athens County—		
Ohio Fuel, Koehler 1	15	1624
Koehler 2	10	1643
Belmont County—		
Wiser Oil Co., Moore 1	•	901
Coshocton County—		
Blackburn & Blackburn, Crawford 1	¶1.0	3035
Ohio Fuel, Bumpus 1	•	3390
Fairfield County—		
City Nat. Gas, Renshaw 1	¶0.03	2202
Hancock County—		
Williams & Moore, Turley 1	4	1370
Hocking County—		
Kachelmacher, Poston 1	•	2214
Holmes County—		
Ohio Fuel Gas, Young 1	¶0.18	3100
Knox County—		
Ohio Fuel Gas, Miller 2	•	2997
J. B. Reed, Blubaugh 1	•	2905
Licking County—		
Settles Oil, Thompson 4	12	600
McClay Bros., Martin 1	30	2816
Ohio Fuel, Miles 1	¶0.95	2558
Van Tassel 2	¶0.3	2405
Shuff & Bucy, Wright 1	¶0.9	2440
National Gas, Miller 1	¶0.5	2410
Geo. Penick, Eshelman 1	¶0.55	2700
Lorain County—		
Ohio Fuel Gas, Straub & Wise 1	¶0.13	2773
Medina County—		
Marine Tr. Co., Packard A-60	5	392
Meigs County—		
Cooper-Lamp, Betzing 1	¶0.05	1250
Morgan County—		
W. S. Harris, Workman 1	¶1.8	996
Williams Bros., Olney 2	•	875
Milner 1	•	875
Muskingum County—		
Ohio Fuel Gas, Offenbacker 1	¶10.0	4262
Fee 3	¶0.5	4064
Pure Oil, Moody 1	¶2.25	4002
Atha Realty, Ellerman 3	•	4075
Noble County—		
Marion Oil, Guiler 1	•	1610
John Cisler, Marquis 3	•	900
Seneca County—		
C. R. Temple, Henrick 1	•	1730
Tuscarawas County—		
Brendyel Prod. Co., Boltz 1	¶0.3	1034
Washington County—		
Burt Oil, Forshey 1	10	301
Charles Ross et al, Ammon 1	•	4652
Phillip Bros., Sherbourne 1	•	615
Wood County—		
Ed Radner et al, Nelson 1	•	1875

Oklahoma

Company, Well and Location	Init. Prod. Bbls.	Depth
Carter County—		
Dillingham & Locke, Herrell 3, ne ne sw ne 22-2s-2w	34	1040
S. & D. Daube, Fee 6, ne sw sw 17-4s-2w	•	2685
W. H. Smith, Ward 17, ne nec 19-4s-2w	421	2153
Gibson & Jennings, Herrell "A" 5, ne sw nw 20-4s-2w	691	2209
Herrell "A" 6, sw sw nw 20-4s-2w	48	2328
Creek County		
Tibbens, Welch 1, swc 4-14n-10e	42	3188
Lewis, Jones 4, se se sw 32-15n-7e	384	2832
Shell, Denny 1, sw se nw 32-15n-7e	129	2815
Jones 2, ne nw sw 32-15n-7e	101	2866
Jones 5, ne sw sw 32-15n-7e	273	2882
Regal Oil Co., Nichols 2, nw sec nw 1-18n-8e	10	2416
B. F. Green, Fee 1-A, nw ne ne 32-18n-11e	•	1665
Grady County—		
Atkinson, Billy 1, c nw nw 26-5n-7w	•	125
Hughes County—		
Commercial Drl. Co., Cox 3, nw sw ne 21-9n-9e	¶3.1	1676
Jackson County—		
Mathews & Thorpe, Vaughn 1, se ne ne 9-1n-20w	•	1607
Fair-Porter Drl. Co., Wilson 1, c se sw 30-2n-22w	•	6515
Lincoln County—		
Vanderpool et al, Minshall 1, sec sw 11-16n-3e	•	525
Logan County—		
Mid-Continent, Dobson 2, 2 n½ se se 11-17n-1w (pb 4923)	65	5212
H-P Gas Co., Speaks 1, c ne ne 4-17n-4w	20	4897
Marshall County—		
E. L. Gill et al, Adams 1, ne sw ne ne 6-8s-6e	50	538
Noble County—		
Samedan et al, Briggs 1, sec sw 29-21n-1w	•	5075
Okfuskee County—		
Doak & Hughes, Community 3, se sw ne 16-10n-11e	125	2844
Portable, Replogle-Johnson 1, ne se se 1-11n-8e	3888	4148
Alma, Replogle 1, nw sw nw 14-11n-10e	40	3215
Devonian, Phillips "B" 2, nw se sw 26-12n-8e	150	3705
Okmulgee County—		
E. Price, Stevens 1-A, c nw nw 10-14n-14e	•	1227
Blanchard et al, Colbert, ne ne sw nw 16-14n-14e	•	860
Osage County—		
Peters Pet. Co., 1, sec 10-22n-10e	12	1713
I. T. I. O., 477 sw ne nw nw 13-25n-11e (pb 1378)	¶1.5	1948

When you hit bottom water, there's no time for monkey-business. Minutes mean dollars. Seal off water quickly, efficiently, with Eagle Lead Wool. This soft, flexible metallic wool becomes a solid plug under tamping pressure. Fills hole completely—seals tiniest cracks and crevices. Non-corrosive, permanent. Eagle Lead Wool is rapidly installed with Eagle Wire Containers. They're shaped like a cartridge to carry wool to water cavity in one mass. Sizes to fit all casings.

Be ready for bottom water—order today through your jobber.

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Eagle Durable—for low speed and pressure conditions

EAGLE LEAD WOOL

Seals off bottom water PRONTO!

EAGLE EP PICHER

THE EAGLE-PICHER LEAD COMPANY
CINCINNATI, OHIO

Company, Well and Location	Init. Prod. Bbls.	Depth
Magnolia, 4, sw ne nw . 14-26n-6e	100	2913
Stanolind, 13, sw nw se 18-27n-8e . 14, nw se se 18-27n-8e	300 46	2492 2415
Blackwell, 10, se sw sw 3-28n-11e	112	963
7, sw nw nw 10-28n-11e	25	990
Payne County		
Mid-Continent, Ramsey 15, sw se nw 18-18n-2e	4283	4610
Pontotoc County—		
Troup, Hall & Moore, Haskins 2, nw sw sw 26-5n-4e	*	2725
Pottawatomie County—		
Denver P. & R. Co., Decker 1-A, se sw se 8-7n-4e (pb 4119)	210	4163
J. F. Smith, Brandenberg 1-A, ne ne sw nw 21-7n-4e	*	4321
Tiffin 1, sw nw sw 26-8n-4e	240	3870
Seminole County—		
Eason & Grisso, Huddleston 1, ne se sw 3-6n-6e (pb 2834)	¶7.0	2900
Barns & Traugh, Jackson 1-B, se nw se 14-7n-7e	*	3532
Mid-Continent, Ferguson 1, sw se sw 18-7n-8e	*	1520
Ligon & Wilson, Malone 1, nw ne se 16-8n-8e	200	3941
Micco O. & G., Davis 1, nec 33-10n-8e	*	3531
OLD WELLS DEEPENED		
Caddo County—		
Magnolia, Niles 1, se se nw 36-6n-10w (otd 2354)	50	3265
Oklahoma County—		
Sunray, Harn 4, ne sw ne nw 27-12n-3w (otd 6490)	300	6541
Okmulgee County—		
Swick, Noble 1-A, c n½ nw sw 22-14n-14e (otd 433)	*	1864
GAS INPUT WELLS		
Okmulgee County—		
J. E. Dow, Chapman 5-A, ne ne sw nw 13-14n-14e	..	1085
Osage County—		
Sinclair-Prairie, 50, sw sw nw nw 20-23n-12e	..	1761

Pennsylvania

BRADFORD DISTRICT

N. V. V. Franchoe, Campbell	5	....
Messer Oil Corp., Redfield	1	....
Kendall Scott Co., Fee	3	....
Ryder Scott Co., Fee	3	....
Grant & Mohan Oil Co., No. 3 Bing 486-7	1	....
F. H. Givan, Bing 317-31-33-27	1	....
W. D. & F. T. Barry et al, Barry	1	....
Forest Oil Corp.	1	....
Forest Pet. Corp., 2 wells	2	....
Niagara Oil Corp., 6 wells	6	....
Bradford Tr. Co., 24 wells	24	....
WATER INTAKE WELLS		
Mix Creek Oil Co., Fee	..	....
Hardwick, Rice & Tuohy, Fisher	..	....
Forest Pet. Corp.	..	....
Forest Oil Corp., 2 wells	..	....
Niagara Oil Corp., 2 wells	..	....
NEW YORK-PENN GAS AREA		
Rogers et al, Josephson	¶	....
G. L. Cabot, Inc., Hibbard	*	....
MIDDLE DISTRICT		
M. M. Cunningham, Argeon	½	....
H. F. & W. T. Zimmerman, Huff	1	....
South Penn Oil Co., Smith & Grace	1	....
Ohio Oil Co., Carnegie-Illinois	¶	....
WATER INTAKE WELLS		
Shawner Oil Co., Lot 106	..	....
BUTLER-ARMSTRONG DISTRICT		
W. I. Gettman, McWilliams	½	....
D. L. Baird, Whitmire	*	....
SOUTHWEST DISTRICT		
Armstrong County—		
Peoples Nat. Gas, Boyer 1	¶0.22	3078
Clarion County—		
Owens-Illinois, Clark Steel 2	¶0.07	2490
Fayette County—		
Greensboro Gas, Lowe Est. 1	*	2747
Greene County—		
Equitable Gas, Gwynn 1	¶0.5	1375
Hathaway 1	¶0.34	1765
Washington County—		
Foley & Williams, Clark 1	¶6.48	1670
Westmoreland County—		
Peoples Nat. Gas, Blose 1	¶0.01	3656
Dome Gas Co., Carnahan 2	¶1.6	2990

Southwest Texas

CORPUS CHRISTI DISTRICT

Bee County (Wildcat)—		
Hewitt, Dougherty & Ogden, Weiss 1	*	10,034
Brooks County (Alta Mesa)—		
Standard of Texas, Mestina 14	200	2677
Jackson County (Lolita)—		
Magnolia, Hamilton 3	500	5939
Jim Wells County (Alfred)—		
Rowan & Hope, Adams 8	350	4682
Live Oak County (Wildcat)—		
D. C. Norcross, Shary 1	*	2010
Nueces County (Wildcat)—		
Seaboard of Del. Chapman 9, new fld	163	4550
Nueces County (Bentonville-King)—		
Southern Minerals, Walker 11	400	5655
Nueces County (Minnie Bock)—		
Tom Graham, Dugger 2	54	3851
Nueces County (Stratton)—		
Southern Minerals, Stratton 20	400	6625
Stratton 21	400	6650
Refugio County (McFaddin)—		
Barnsdall, Marberry 8	¶25	5659
Simmons, Rutherford & Gulfshore, Fagan 3	500	5700
Refugio County (Tomoconnor)—		
Quintana, Williams 29-A	1500	5925
San Patricio County (Midway)—		
Midway-Victory, Floerke 5-A	500	5350
SAN ANTONIO DISTRICT		
Guadalupe County (Elm Creek)—		
J. E. West, Bretzke 2	6	834
Medina County (Chicon Lake)—		
Charles Wagener, Medina 54-A	7	447
LAREDO DISTRICT		
Duval County (Charamousca)—		
N. V. Duncan, Worden & Drought 2-A	350	1584
Duval County (Kreis)—		
Cox & Hamon, Fite 1, outpost	*	3305
Jim Hogg County (Colorado)—		
C. Andrade III, Trevino 4-A	100	2970
Jim Hogg County (Wildcat)—		
Plymouth, Sweeney 1	*	5604
Starr County (Rincon)—		
Continental, Slick 28-A	500	4230
Slick 50-B	420	4299
Slick 68-B	550	4275
Slick 2-E	*	4178
Starr County (N. Rincon)—		
Sun, Coates 5	*	4546
Starr County (Sun)—		
Sun, Montalvo 9-A	250	4867
Speer-State 8-B	75	4891

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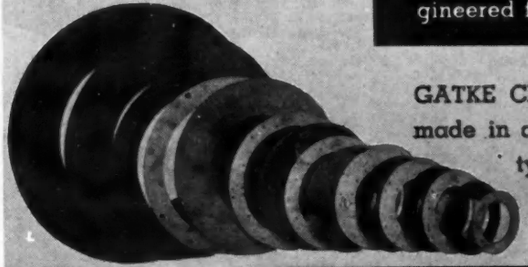

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GATKE CORPORATION

228 N. La Salle St. Gatke Chicago, Ill.

United States Well Completions—*Continued*

Texas Gulf Coast

Company, Well and Location	Init. Prod. Bbls.	Depth
Brazoria County (Hastings)—		
Stanolind's Moore A-4	*	6137
Brazoria County (West Columbia)—		
Texas Co., Abrams 40	300	5630
Chambers County—		
H. E. Williams et al, Trinity Rice Disposal 1	*	8021
Chambers County (Barbers Hill)—		
Texas Gulf, Morgan-Fitzgerald 2	411	4495
Galveston County (League City)—		
Phillips, Ross-Lobit 2	*	8806
Hardin County (Saratoga)—		
Crown Central, Teal 1	*	2977
Hardin County (Sour Lake)—		
Chambers & Edwards, Minor Fee 89	28	1553
Harris County (Dyersdale)—		
Jack Frazier, Griffith 7	220	3559
Jack Frazier, Wood 1	215	4077
Liberty County (Hull)—		
W. M. Hill, Jr., Kaplen & Cutrer 1	*	4350
Liberty County—		
The Texas Co.'s Barrow 9	196	5553
Matagorda County (N. Markham)—		
Ohio Oil Co., Carlson 6	165	7984
Montgomery County (Lake Creek)—		
Superior, McWhorter 2	197	9980
Wharton County (Withers)—		
Texas Co., Pierce C-98	104	5375

East Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Joiner Area—		
Stanolind, Schuyler 7-A	160	3672
Tide Water, Irion 14	500	3675
Zephyr Oil Co., Glover 7-B	180	3643
Kilgore Area—		
Magnolia, Griffin 26	480	3610
Shell, Bates 27	2200	3595
C. R. Starnes et al, Money 14	1500	3730
Longview Area—		
Atlantic Ref., Lee 20	3000	3748
General Am. Oil Co., Stancil 3-A	240	3675
Lucey Pet. Co., Fisher 15	2000	3525
W. G. Ray et al, Tubbs 3	600	3600
Anderson County (Long Lake)—		
Long Lake Prod. Co., Cartmel 1	*	5446
Franklin County (Talco)—		
Humble, Fenn-Humble 26	480	4292
Smith County (Wildcat)—		
P. L. Ross et al, Rushing 1	*	4606
Wood County (Wildcat)—		
Plains Prod. Co.-Al Bierman, Jones 1	*	4735

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Cities Service, Burnett 40-A	¶18.5	2610
Gray County—		
Bradshaw O&G Co., Sackett 10	68	3311
Cady-Conner-Crenshaw, Holmes 4	151	3258
Madza Oil Corp., Combs-Worley 7	76	3000
Stanolind, Merten 17	136	3332
Stanolind-Magnolia, Saunders 11	224	3115
Texas Co., Davidson 2	251	3133
Hutchinson County—		
Phillips Pet., Cockrell 68	187	2955
Cockrell 71	44	3092
Shell, Harvey Sisters 22	282	3070
Skelly Oil, Watkins 16-B	244	2850
Stanolind, Haile 23-B	135	3043
Moore County—		
Shell & Sinclair Prairie, Morton 1	¶420.0	3072
Potter County—		
Canadian River Gas Co., Bivins 27-A	†	2455

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Crane County (Ella Waddell)—		
Gulf, Waddell 41	*	3771
Crane County (Sand Hills Deep)—		
Gulf et al, Tubb 4-A	2501	5756
Crockett County (Soma-Noelke)—		
Henry Schooler-Curtis Norman, Bouscaren 1	*	2139
Crockett County (World-Powell)—		
G. M. Smith et al, Powell-Gulf 1-A	144	2677
Ector County (Douro)—		
Forest Dev. Corp., Edwards 1-C (pb 4320)	86	4502
Ector County (Foster)—		
Atlantic Ref., Johnson 7-C	61	4215
Sinclair Prairie, Gist 3	790	4305
Stanolind, Johnson 23-A	235	4155
Ector County (Goldsmith)—		
Gulf, Goldsmith 360	1098	4259
Ector County (North Cowden)—		
Broderick & Calvert, Holt 17-A	582	4503
Sinclair Prairie, Johnson 9-D	2648	4125
Gaines County (Seminole)—		
Skelly Oil, Robertson 2 (pb 5265)	216	5285
Hockley County (Slaughter)—		
Delta Dr. Co., Slaughter 4-C	226	4959
Slaughter 5-C	267	4960
Honolulu Oil Corp., Slaughter 14-B-19	1137	4990
Slaughter 15-B-21	1142	5005
Magnolia, Mallet 5-D	713	4995
Mid-Continent Pet. Corp., Mallet 4-B	1125	5022
Sid Richardson et al, Slaughter 10	662	4970
Slaughter 12, Lab 8	771	4985
Slaughter 27-B, Lab 19	331	4965
Stanolind, Slaughter 19-B	817	4987
Slaughter 20-B	509	4996
Texas Co., Baker 1	1622	5030
Lucas 1	221	5035
Mallett 3-E	853	5048
Mallet 4-E	1300	5030
Howard County—		
C. T. McLaughlin & Co., Snyder-Shell 3	65	2845
Martin County (Wildcat)—		
Pete Wiggins-Ed Hyde, Stimson-Burley 1	*	5003
Mitchell County (Northwest)—		
E. R. Lloyd et al, Fuller 1	52	1722
F. W. Merrick, Inc., Crawford 1-A	212	1760
Pecos County (Taylor-Link)—		
Landreth Prod. Corp., University 3-L	1054	1680
Pecos County (Tobarg)—		
Stanolind, Smith 10-B	43	480
Scurry County (Sharon)—		
D. & R. Oil Co., Burney 4	85	2428
Terry County (Wildcat)—		
Texas Co., Murphy 1	*	5440
Terry County (Slaughter)—		
Gulf, Mallet 7	1703	5025
Honolulu Oil Corp., Frazier 7	2305	4950
Upton County (Gulf-McElroy)—		
Gulf, McElroy 248	306	3120
Winkler County (Gulf-O'Brien)—		
Gulf, O'Brien 171	80	2771
Winkler County (Keystone)—		
Richardson Oils, Inc., Walton 5, sec 5	152	3333
Yoakum County (Wasson)—		
Aloco Oil Co., Moore-Texaco 6	158	5239
Don Danvers et al, Willard 7-B	442	5290
Denver P&R Co., Whittenburg 31	637	5171
Humble, Bennett 19	609	5275
North Shore Corp., Bennett-Humble 8	304	5272
Shell, Corder 4 (pb 4993)	163	5030
Sinclair Prairie, Willard 5	974	5283
Willard 7	756	5300
T. P. Coal & Oil Co., Hearne 8	940	5265

OLD WELLS DEEPENED

Company, Well and Location	Init. Prod. Bbls.	Depth
Winkler County (Kermit)—		
Adams-Hitchcock-Bradley, Walton 8-A (otd 2846)	18	3098
Walton 9-A (otd 2816)	19	3092

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County (Wildcat)—		
Harry E. Murray et al, Fry 1	*	1428
Brown County—		
Hou-San Oil Co., Sewalt 4	6	945
Callahan County (Wildcat)—		
Merry Bros. & Perini, DeSpain 1	*	3156
Coleman County (Wildcat)—		
McKissick & Robertson, Finley 1	*	3526
Eastland County—		
Hickok Prod. & Dev. Co., Wright-Harrell 3	91	3369
Hamilton County—		
Lone Star Gas, Rea 1	*	2935
Jones County (Wildcats)—		
M. C. L. Corp., Swanson-Swenson 1	*	3350
J. L. McMahon et al, Miller 1	*	2911
Jones County—		
Danciger O&R, Kelso 3	*	2750
Fain-McGaha Oil Corp., Shaheen 10	175	1896
Humble, Irwin 9	210	2405
King Oil Co., Almquist 2	560	3207
Pet. Producers Co., Akard 2	125	2141
Palo Pinto County (Wildcat)—		
W. K. Gordon et al, Crouch 1	*	3557
Shackelford County (Wildcat)—		
Cecil Young et al, Simpson 4	*	518
Shackelford County—		
Hickok P&D Co.-Harry Reynolds, Swenson 2-A	*	1537
R. H. Roark et al, Elliott 6	*	830
E. H. R. Sabens et al, Shotwell 1	40	1648
Stanfield & Tubbs, Clarke 4	5	622
Stephens County—		
Wittmer O&G Prop. Knight-Ewing, McKelvain 1	†	1320

North Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Hull-Silk Deep)—		
R. C. Lipscomb et al, Wilson 1	1212	4610
Archer County (Hull-Silk)—		
Southern Pet. Explo., Inc., Moss 12	472	4303
Archer County—		
Guy J. Brown et al, Johnson 1 (pb 1120)	2	2028
Perkins 1-E	10	1034
C. T. Hedges et al, Griffin 23-A	9	1310
Pet. Producers Co., King 9	10	1259
Jack Storey Jr. et al, Wilson 1-B	85	1534
Young & Woody Dr. Co., Meade 6-B	10	965
Archer County (Wildcats)—		
Bridwell Oil Co., Bridwell 1-D	*	916
Bridwell 4-D	*	920
Staley Oil Co.-L. C. Heydrick, Donahue 1	*	1456
Clay County (Antelope)—		
Shell, Henderson 18	648	3217
Clay County—		
Gorman & Norwood, Taylor 8	*	1157
Perkins & Cullum, Taylor 10-A	144	1064
Stayton Oil Co., McGregor 9	55	1196
Sussex Oil Corp., Glasgow 27	27	1076
Cooke County (Bindel)—		
Sinclair Prairie, Dangelmayr 1	*	3784
Cooke County—		
Frank Hood et al, Parkey 16	10	731
Texas Co., Trubenbach 26	50	789
Cooke County (Wildcat)—		
C. H. Gannon-Harvey Dr. Co., Ware 1	72	2227
Jack County (Wildcat)—		
W. H. Carter et al, Carney 1	*	3370
Jack County—		
Panhandle Ref. Co., Daniels-Eaton 6	7	3107
3-Bee Inv. Corp., Armstrong 2	200	3282
Montague County—		
J. M. Hawley et al, Bouldin-Crow 7	21	814
Montague County (Benton-Holmes)—		
Mudge Oil Co., Custers 3 (pb to 3008)	120	3588
Throckmorton County (Wildcat)—		
Rathke Oil Co., Swaggerty 1	*	5307
Wichita County (KMA Ellenberger)—		
Cochran & Cain, Preston 3-B	560	4467
Consolidated Oil, Ferguson 28-E	1424	4310
Fain-McGaha Oil Corp., Griffin 5-B-E	996	4358
Wichita County (K-M-A)—		
W. P. Lincoln-Leo Moore, Bradley 3	448	3890
Bradley 4	416	3782
Wichita County—		
Akin-Dimock-Costley, Dodson 10-A	*	1350
Continental Oil, Waggoner Est. 32-A	4	1506
Mitchell Oil Co., Mitchell 3-B	*	1410
Thos. E. Nix et al, Honaker 2	*	101
Ted A. Norwood et al, Leissler 4	*	1350
Jackson 1	*	1200
Wood & Duncan, Gentry 1	*	1350
Wichita County (Wildcat)—		
Akin-Dimock-Costley, Roller 1	*	1651
Wilbarger County (Consolidated)—		
Consolidated Oil, Ancell 4-B (new pay)	102	4381
Wilbarger County (Fargo)—		
Amerada, Dodson 2	360	4034
Humble, Anderson 2	229	4614
Wilbarger County—		
Consolidated et al, Ancell 2-B	18	1768
Waggoner Ref. Co., Waggoner 32-AA	15	1699
Young County (Wildcats)—		
P. C. Burns et al, Bernheart 1	*	1068
W. A. Buttram-J. B. Newby, Ferguson 1	*	563
J. G. Wooten et al, Cantwell 1-A	*	596
Young County—		
L. T. Burns et al, Bloodworth 9	35	884
W. F. Palmer et al, Campbell 15	*	1003
Marshall 6	126	916
Pemeta Oil Co., Tatum 15-B	5	672
Pet. Producers Co., Koester 7	*	1137
Textor Oil Corp.-J. McLester, Knight 3-A	960	3835
Wrightsman Oil Co., Gilmore 1 (pb 2491)	82	2701

Wyoming

Company, Well and Location	Init. Prod. Bbls.	Depth
Sweetwater County (Lost Soldier)—		
Sinclair-Wyoming Oil, Lost Soldier 100-A ne ne ne 10-26n-90w	400	4270
Weston County (Osage)—		
Minnoming O. & G. Co., Government 5, se se sw 18-46n-64w	25	1418
Wheedon Oil Co., State 33, nw nw sw 16-46n-63w	*	250

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Braxton County—		
Pitts. & W. Va., Bourne 7801	¶.06 & 2	2245
Cabel County—		
Earl Hanley, Fee 1	¶0.06	2234
Calhoun County—		
Creed Yoak, Church 1	10	1998
Church 4	15	2201
B. J. Crowley, Daniels 2	2	2006
Gilmer County—		
A. E. Ellis, White 1	¶0.17	2100
Hope Nat. Gas, Meadows 8544	10	1502
Kanawha County—		
Columbian Carbon, Burdette 1	¶1.22	4902
Putnam County—		
Vaughn Gas, Vaughn 2	¶0.92	1102
United Fuel, Womack 5012	¶0.07	3771
Ritchie County—		
Moats & Barker, Moats 3	¶1.17	2010
Clem S. Morris, Cunningham 2	¶0.28	1940
Wayne County—		
Owens, Libby-Owens, Self 1	¶0.03	3141

WILDCAT REPORT
New Starts and Completions

ALABAMA
FIRST REPORT

Monroe County — Vaughey & Andrade's Moore 1, c nw 27-7n-5e, mat.

ARKANSAS
FIRST REPORT

LaFayette County—Ohio Oil Co.'s Garner 1, c nw sw 13-16-24, mat for Smackover-lime test.

COMPLETION

Columbia County—McAlester Fuel Co.'s Franks 1, c se se 16-18-21, elev 265 ft, Smackover 8819 ft, porosity 8827 ft, flowed 14 bbls distillate hour 22/64-in choke, td 9020 ft, new pool.

CALIFORNIA
FIRST REPORTS

Fresno County—Wilshire Annex Oil Co.'s No. 33-26e, sec 26-21-15, lcn, Jacalitos Hills area.

Sacramento County—Amerada Pet. Corp.'s F & C 1, sec 4-6-3, rig, Dixon area. Standard's Productive Properties 1, sec 23-3-3, lcn, Rio Vista area.

Ventura County—Boylan Oil Co.'s Boylan 1, sec 23-1-20, lcn, Canejo area.

COMPLETIONS

Orange County—Master Pet. Co.'s Thurston 1, sec 27-3-9, td 4524 ft, perf 3512-75 ft, mud and water, abnd, Richfield area.

Kern County—Shell's Smith 46-11, sec. 11-26-27, td 2443 ft in gray sand, Vedder 2420 ft, abnd, Mount Poso area. Union's KCL 31-3, Sec 3-30-26, td 12,396 ft in gray sand, barren Stevens 7370 ft, Vedder 12,300 ft, abnd McClung area.

COLORADO
FIRST REPORTS

Adams County—S. W. Pressy's Alamo 3, sw sw sw 10-2s-68w, sp 390 ft, Alamo.

Moffat County—Privett & Spangler's Strealing 1, ne se 12-5n-96w, sp, Day Lakes.

INDIANA
FIRST REPORT

Gibson County—R. D. Brown, Inc.'s Watts 1, sw sw nw 29-2s-14w, lcn.

COMPLETIONS

Daviess County—R. D. Brown, Inc.'s McCracken 1, c s½ sw se 16-2n-6w, Chester 725-33, td 734 ft, 0.6 million ft gas.

Gibson County—Yingling & Hayes' Keiffer 1, c s½ sw se 26-1s-12w, abnd 2413 ft.

Lake County—Schenkel et al's Hough 1, s½ se sw ne 32-34n-7w, abnd 500 ft.

Newton County—A. C. Thomas' Henkle 1, se se se 36-30n-9w, abnd 485 ft.

Starke County—Violette's Kanke 1 s½ sw nw se 18-32n-4w, abnd 800 ft.

Vanderburg County—Ill.-Ind. Prod. Corp.'s Stratman Hrs. 1, c nw nw 14-4s-10w abnd 2140 ft.

ILLINOIS
FIRST REPORTS

Champaign County—Union Prod. Pet. Co.'s Prairie 1, sw nw sw 17-20n-10e, dr. Union Prod. Pet. Co.'s Carson 1, sw ne ne nw 19-20n-10e, comp.

Clay County—Kilpatrick's Irwin 1, nw sw nw 5-5n-5e, dr.

Fayette County—Union Prod. Pet. Co.'s Morrison's 5-D, ne nw sw sw 8-7n-3e, lcn.

Jasper County—A. B. Johnson's Birk 1, c w½ sw se 15-5n-9e, lcn.

Lawrence County—Stacker & Kieffer's Rogers 1, nw se sw, dr.

Marion County—Wise Oil Co.'s Gullich 1, dr. Swan-King's Kotoa Hrs. 1 c s½ sw nw 36-4n-2e, dr.

Richland County—Longhorn Oil Co.'s Broster 1, se se se 9-3s-14w, dr.

Wabash County—Joe Young's Price 1-A, nwc nw 1-1n-12w, dr.

White County—Bruce Martin et al's Williamson 1, c s½ sw sw 19-5s-9e, dr. Spillers et al's Holderby 1, se sw ne nw 35-6s-9e, dr.

COMPLETIONS

Champaign County—Union Products Pet's Prairie 1, sw nw sw 17-20n-10e, abnd, 344 ft. Union Prod. Pet. Co.'s James 1, se sw se 18-20n-10e, abnd 342 ft. Union Prod. Pet. Co.'s Carson 1, n½ ne nw 19-20n-10e, abnd 324 ft.

Coles County—Bancroft et al's Aetna Life Ins. 1, nw sw se 7-11n-14w, abnd 863 ft.

Effingham County—Paul Doran et al's Dasenbrock 1, nw nw se 16-8n-6e, abnd 2551 ft.

Hamilton County—Texas Co.'s McDonald 1, nw ne se 11-6s-6e, aux vases 3071-78 ft, 106 bbls. Ryan Oil Co.'s Hunt 1, se se ne 23-6s-8e, abnd 3332 ft.

Randolph County—J. R. Rankin et al's Bierman 1, sw sw se 3-7s-5w, abnd 1208 ft.

Richland County—John Davis' Schan 1, c w½ sw nw 27-3n-9e, McClosky 3036-50, td 3059 ft, 42 bbls.

Shelby County—Moore et al's Fee 1, sw sw ne 30-10n-3e, abnd 1936 ft.

St. Clair County—Kunze's McCurdy 1, w½ se sw sw 29-3s-6w, abnd 635 ft.

Wabash County—Paul Osborne et al's Dunkel 1, nw nw nw 6-1s-12w, abnd 2520 ft. White & Wickwire's Price 1, ne nw ne sw 14-1n-12w, Tar Springs 1625-36 ft, td 2360 ft, 20 bbls water, 42 bbls oil. E. B. Hill et al's Wood 1, ne se se 21-2n-14w, abnd 3094.

White County—H. K. Riddle's Farmers Nat'l. 1, s½ sw nw 30-3s-14w, abnd 3138 ft.

KANSAS
FIRST REPORTS

Barton County—Shell's Kinzell 1, sec sw 2-18-12w, dr. Helmerich & Payne et al's Unruh 1, c e½ ne nw 16-20-15w, dr.

Douglas County—J. B. Epperson et al's Howard 1, c se nw 25-13-19e, sd 1206 ft.

Graham County—J. B. Epperson et al's Howard 1, c se nw 25-13-19e, sd 1206 ft.

Graham County—Cities Service Oil Co.'s Montgomery 1, sec nw 7-8s-23w, dr.

Leavenworth County—Black Gold Operating Co.'s Fevurly 1, c sw se 1-9-20e, dr.

Scott County—Atlantic's Smith 1, c ne ne 34-19-33w, dr.

Stafford County—Hamilton & Hawkins' Ward 1, nec sw 15-23-13w, mim. Stanolind's Black 1, c e½ ne sw 25-24-12w, dr. Elbar Oil Co.'s Curtis 1, nec 18-25-13w, dr.

Trego County—W. M. McKnab et al's Mattke 1, c n½ nw nw 17-12-22w, mim.

COMPLETIONS

Barton County—Olson Oil Co.'s Oltman 1, nec sw 15-17-13w, between Hoisington and Ainsworth pools, Anhydrite 809 ft, Ft. Riley 1799 ft, Neva 2155 ft, Topeka 2740 ft, Lansing 3128 ft, Conglomerate 3370 ft, Reworked Arbuckle 3382 ft, Arbuckle 3407 ft, abnd 3455 ft.

Doniphan County—Plymate & Bornholdt's Elliott 1, c e½ se sw 31-3s-20e, 8 mi sw Troy, Kansas City 720 ft, Mississippi 1679-2035 ft, Misener 2175 ft, Hunton 2195 ft, Viola 2632 ft, Arbuckle 2898 ft, abnd 2950 ft.

Jefferson County—Caufield & Sullivan's Ragan 1, swc se 19-10-20e, 3 mi sw McLaughlin pool, new disc, Burgess sd 1545 ft, Mississippi 1565 ft, td 1710 ft, pb 1629 ft, 3000 gals acid, 300 gals butane, 4 bbls.

McPherson County—Westgate-Greenland Oil Co.'s Rosander 1, c e½ sw sw 33-17-2w, 4 mi sw Roxbury pool, Mississippi 2998 ft, abnd 3005 ft.

Norton County—E. J. Shaffer & Hall-Jordan Oil Co.'s Vanmayrhauser 1, c n½ nw ne 26-5-22w, 8 mi w Ray pool, Anhydrite 1785 ft, Topeka 3140 ft, Lansing 3355 ft, Conglomerate 3625 ft, no Arbuckle or LaMotte, Granite 3686 ft, abnd 3722 ft.

Phillips County—H. L. Wirick et al's Fribus 1, c w½ sw nw 36-2s-19w, 21 mi ne Ray pool, Anhydrite 1560 ft, Lansing 3169 ft, Marmaton 3413 ft, Arbuckle 3535 ft, Granite Wash 3815 ft, td 3861 ft in Granite, 6000 gals acid in Lansing, 328 bbls, 32 gr.

Russell County—Cities Service Beisel 1, nec nw 15-14-12w, 3 mi n Greenvale pool, Lansing 2944 ft, Conglomerate 3242 ft, Arbuckle 3315 ft, abnd 3340 ft.

KENTUCKY
FIRST REPORT

Ohio County—M. P. Evan's Schultz 2, 15-m-34, comp.

COMPLETION

Ohio County—M. P. Evans' Schultz 2, 15-m-34, abnd 260 ft.

NORTH LOUISIANA
FIRST REPORTS

Catahoula Parish — Oglesby Dr. Co.'s Womack 1, se 33-9n-5e, mat.

Franklin Parish—Grubb & Hawkins' Campbell 1, se ne 1-11n-7e, mat.

COMPLETIONS

Morehouse Parish—Union Prod. Co.'s Hinkle 1, sw sw 3-21n-7e, abnd 3000 ft.

Winn Parish—Nat Wissman's Quinn 1, 38-9n-6w, abnd 2604 ft.

MICHIGAN
FIRST REPORT

Ottawa County—Southwest Dev. Co.'s Miller 1, nw ne sw 26-5n-13w, rig.

COMPLETIONS

Allegan County—W. Spencer Cook's Sebright 1, nw sw sw 28-3n-12w, Traverse 1688 ft, abnd 1696 ft.

Cass County—N. N. Smith's Wilhelm 1, nw sw se 12-8s-15w, Traverse 680 ft, abnd 780 ft.

Missaukee County—Twin Dr. Co.'s Gray 1, c sw, 33-23n-5w, abnd 995 ft.

Roscommon County—Sun's Hogan 3, c s½ se se 31-23n-4w, Dundee 3620 ft, abnd 3721 ft.

MISSOURI
COMPLETION

Ray County—R. L. Campbell et al's Rust 1, c n½ nw sw 21-53n-26w, 12 mi ne Richmond, Mississippi 580-860 ft, Hunton 865 ft, Viola 1105 ft, St. Peter (Wilcox) 1219 ft, Arbuckle 1289 ft, abnd 1295 ft.

NEBRASKA
COMPLETION

Nemaha County—Bow & Arrow Drl Co.'s Wrightsman 1, c w½ sw nw 36-6n-14e, 4 mi ne Auburn, base Kansas City 1027 ft, Mississippi 1993-2160 ft, Hunton 2452 ft, abnd 2580.

NEW MEXICO
FIRST REPORT

Eddy County—Flynn, Welch & Yates' Parcell 1, sw ne nw 34-19s-29e, mim.

OKLAHOMA
FIRST REPORTS

Grant County—Chaplin's Cruse 1-A, c s½ se sw 29-25n-8w, dr.

Jefferson County—Gibson & Jennings et al's Wilson 1, c nw ne 25-3s-5w, dr.

Roy M. Johnson's Hefner 1, se sw ne 30-3s-4w, dr. B. L. Fain's Owens 1, c ne se 7-5s-8w, lcn.

Kiowa County—Badger & Grover's Clark 1, swc ne 19-7n-16w, dr.

Lincoln County—Logan & Cooper's Oestmann, 1, se ne se 11-16n-5e, dr.

Noble County—Elm Oil Co.'s Hicks 1, sec sw 36-23n-2w dr.

Okfuskee County—Shell's Palmer 1, sw nw sw 6-10n-9e, dr.

Osage County—Herman Madvine et al's Osage 1, nwc sw 14-22n-10e, dr.

Payne County—T. N. Berry et al's Fee 1, nw ne sw 13-18n-3e, dr.

Pottawatomie County—Big Chief Drl. Co. et al's Airhart 1, nec sw 5-9n-4e, dr.

COMPLETIONS

Creek County—Mid-Continent Pet. Corp.'s Bear 1, se sw se 3-14n-7e, 3 mi w Stroud pool, new disc, Hogshooter 1313 ft, Layton 1450 ft, Checkerboard 1705 ft, Cleveland 1757 ft, Prue 2621-55 ft, Redfork 3075 ft, Inola 3085 ft, Bartlesville 3113 ft, Pitkens 3425 ft, Simpson 3450 ft, Mayes 3585 ft, Woodford 3815 ft, Slyvan 3845 ft, Viola 3925 ft, Dolomite 3955 ft, First Wilcox 3972-74 ft, Second Wilcox 3991 ft, td 3993 ft, pb 2680 ft, shot 100 qts 2626-72 ft, 2 bbls oil 213,000 ft gas.

Garvin County—Ohio Oil's Feaster 1, nwc se 13-3n-1e, 4 mi e Pauls Valley, sh & sd 2693-76 ft, Oil Creek 3510 ft, Arbuckle 3980 ft, abnd 4401 ft.

Kay County—Marr & Vaughn's Constant 1, c n½ ne se 6-27n-1w, Blackwell area, Oswego 3250 ft, Wilcox 3503 ft, Arbuckle 3636 ft, abnd 3734 ft.

Lincoln County—R. L. Kemp's McLaurey 1, sec sw 28-17n-5e, 2 mi ne Agra pool, Hogshooter 1980 ft, Checkerboard 2250 ft, Oswego 3067 ft, Bartlesville 3465-90 ft, Wilcox 3994-98 ft, abnd 4002 ft.

Noble County—Superior Oil Corp's Faubian 1, se sw se 16-22n-1e, 1 mi n extension Otoe City pool, Oread 2600 ft, Avant 3005 ft, Layton 3395 ft, Mississippi 4470 ft, Woodford 4603 ft, Viola 4674 ft, Dolomite 4716 ft, First Wilcox 4723 ft, Second Wilcox 4880 ft, td 4925 ft, pb 4765 ft, 18 holes 4728-30½ ft, 10 holes 4727-31½ ft, 180 bbls 3-16 in ch, 41.2 gr.

Okfuskee County—Mico O. & G. Co.'s Curry 1, nw se nw 17-12n-8e, 2 mi nw Boley, Brown li 3520 ft, Booch 3619 ft, Gilcrease 3710 ft, Cromwell Unconformity 3825 ft, Pitkins 3870 ft, Caney 3890 ft, Woodford 4315 ft, Misener 4347 ft, Hunton 4348 ft, Sylvan 4405 ft, abnd 4412 ft.

Payne County—Anderson-Prichard et al's McGuire 1, sec nw 20-18n-1e, 3½ mi w Ramsey pool, Pawhuska 1710 ft, Middle Pawhuska 1840 ft, Lower Pawhuska 2000 ft, Avant 3181 ft, Dewey 3308 ft, Checkerboard 4150 ft, Oswego 4407 ft, Mississippi 4854 ft, Woodford

[*Continued on next page*]

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OKLAHOMA—*Continued*

5006 ft, Misener 5050 ft, Hunton 5051 ft, Sylvan 5053 ft, Viola 5139 ft, Dense 5180 ft, Dolomite 5190 ft, Second Wilcox 5271 ft, abnd 5301 ft.

Pottawatomie County—Helmerich & Payne's School Land 1, nwc ne 16-7n-5e, 2 mi e St. Louis pool, new disc, Calvin 2795-2820 ft, Earlsboro 3230-90 ft, Brown li 3395 ft, Caney 3450 ft, Mayes 3620 ft, Woodford 3725 ft, Viola 3990 ft, Dense 4025 ft, Dolomite 4045 ft, First Wilcox 4111 ft td 4119 ft, 2000 gals acid, 466 bbls.

Seminole County—Winona Oil Co. et al's Heller 1, nec 25-10n-7e, 1¼ mi ne North Bethel pool, new disc, Brown li 3187 ft, Booch 3305-19 ft, Gilcrease 3432-44 ft, sd 3458-62 ft, Wapanucka 3487 ft, sdy li 3551-56 ft, Cromwell sd 3556-57 ft, td 3572 ft, 42.0 million ft, rock pressure 945 ft.

Stephens County—Skelly Oil et al's Frensley-Robbertson 4, c ne ne 35-1s-5w, new horizon Velma pool, Mississippi Caney 3410 ft, Sycamore 3675 ft, Brown li 3820-47 ft, Woodford 3990 ft, Hunton 3605 ft, Sylvan 5216 ft, Viola 5540 ft, Simpson Dense 6770 ft, Bromide sd 7124 ft, base Tulip Creek 7730 ft, td 7803 ft, pb 7580 ft, pay 7142-94 ft, 45 holes 7200-15 ft, 145 holes 7140-90 ft, 44 holes 7120-35 ft, 132 bbls.

EAST TEXAS

FIRST REPORTS

Harrison County—Capps Bros.' Eldridge 1, Joel Crain sur, rig.

Henderson County—A. J. Tyler-Garonzik & R. C. Heinen's Dozier 1, 136½-ac tr, Geo. T. Walters sur, lcn.

Marion County—Dean Bros.' Fee 1, B. F. Weathered sur, lcn; Fee 2, Isaac Johnson sur, lcn.

COMPLETIONS

Smith County—O. L. Ross et al's Rushing 1, swc 28-ac tr, Jacob Herrin sur, elev 429 ft, Pecan chalk 3130-3260 ft, Austin chalk 3992-4298 ft, Woodbine 4290 ft, abnd 4606 ft.

Wood County—Plains Prod. Co.-Al C. Bierman's Jones 1, nec 2-ac tr, Jason Sherman sur, Alba townsite, elev 458 ft, Pecan chalk 2393-2505 ft, Austin chalk 3610-3946 ft, Woodbine 4428 ft, abnd 4735 ft.

SOUTHWEST TEXAS

FIRST REPORTS

Bee County—W. Earl Rowe's O'Connor 1, P. Crain sur, 2½ mi n Skidmore, lcn 5200-ft test.

Bexar County—J. A. Tarver et al's Uecher 2, Burchard sur, 15 mi se San Antonio, sp 1800-ft test.

Caldwell County—Ralph Ogden's Chamberlain 1, Burleson sur, 4½ mi nw Dale, lcn 3000-ft test.

Calhoun County—Leslie Johnson's McKamey 1, Gemmell sur, 4 mi se Placedo, lcn 7000-ft test.

Duval County—C. A. Maley & J. W. McGee et al's Holzapfel 1, blk 2, sur 42, 22 mi nw Freer, lcn 1200-ft test. Henderson Coquat's Southland 1, Sec 3, 2 mi sw Sweeden townsite, lcn 6000-ft test.

Jim Hogg County—Sal Vieja Oil Co.'s Vela 1, sh 3, El Peyote gr, lcn 3250-ft test.

San Patricio County—Chiltipin Oil Co.'s McRae 1, McGloin sur, 3 mi nw Mathis, lcn 4850-ft test.

Starr County—Lewis Prod. Co.'s Osborn 1, sh 1, Loa Retachez gr, 4 mi nw Sun fld, lcn 6500-ft test.

Webb County—Magnolia's Duval Ranch, League 3, 15 mi w Freer, lcn 3000-ft test.

COMPLETIONS

Bee County—Hewitt, Dougherty & Ogden's Weiss 1, Uranga gr, 4 mi e Tuleta, abnd 10,034 ft in Wilcox.

Duval County—Cox & Hamon's Fite 1, Sec 87, 2 mi sw Krels fld, abnd 3305 ft.

Jim Hogg County—Plymouth Oil Co.'s Sweeney 1, Las Animas gr, 30 mi se Hebbronville, abnd 5604 ft.

Live Oak County—D. C. Norcross' Shary 1, Tr 3412, Sec 73, 1½ mi s White Creek fld, abnd 2010 ft.

Nueces County—Seaboard of Del.'s Chapman 9, sec 45, between Chapman and Luby flds, 163.32 bbls 27.9-gr, no water, low gas/oil ratio, td 4550 ft, sand 4269-79 ft, 5½-in 4300 ft, perf 4270-74 ft, new fld.

WEST CENTRAL TEXAS

FIRST REPORTS

Brown County—Frank L. Walker et al's Cox-McInnis 1-A, Sam Barrows sur 27, lcn.

Stephens County—Orion A. Daniel et al's Black 1, SWc TE&L sec 1283, lcn.

COMPLETIONS

Brown County—Harry E. Murray et al's Fry 1, n corner John Williams sur 33, Ellenberger 1222 ft, abnd 1428 ft.

Callahan County—Merry Bros. & Perini's DeSpain 1, SEc of 176-ac tr, S.P. Ry sec 32, blk 8, abnd Palo Pinto lime 3134-56 ft.

Coleman County—McKissick & Robertson's Finley 1, T&NO sec 45, blk 2, abnd 3526 ft.

Jones County—Jas. L. McMahon et al's Miller 1, se part subdi 13, DeWitt CSL leag 125, elev 1755 ft, abnd hfw 2909-11 ft. M. C. L. Corp's Swanson-Swenson (Sinco) 1, near c nw nw BBB&C sec 187, elev 1535 ft, Palo Pinto 3343 ft, abnd 3350 ft.

Palo Pinto County—W. K. Gordon et al's Crouch 1, T&P sec 8, blk 3, elev 1076 ft, abnd 3557 ft.

Shackelford County—Cecil Young et al's Simpson 4, nw se sw BAL sec 13, abnd 518 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—Jack E. Kadane, Tr's Schlabs 1, nwc lot 48, blk 3, Clark-Plumb subd, dr 550 ft. Ted A. Norwood et al's Cross 1, nec se TE&L sec 2491, dr 210 ft, Carroll C. Robertson et al's Winters 1, sw se lot 80, blk 4, Clark-Plumb sur, sd 1132 ft.

Clay County—W. H. Metzner et al's Meyers 1, 100-ac tr, sec 48, E. Story sur A-419, sp, Darby-Lynde Co.'s Stine 1-40-B, sec 7, Byers sur, lcn.

Cooke County—Cochran & Cain's Drane 2, E. Lankford sur A-566, lcn.

Young County—W. A. Buttram et al's Ferguson-Smith 1, nec of L. W. Smith sur A-1822, lcn. Wooten & Wilson's Webb 1, A. Rohus sur, lcn.

COMPLETIONS

Archer County—Bridwell Oil Co.'s Bridwell 1-D, ne nw TE&L sec 1853, Gunsight 804-06 ft, abnd 916 ft; Bridwell 4-D, sec 1853, abnd 920 ft, Staley Oil Co.-L. C. Heydrick's Donahue 1, A. Edwards sur A-124, abnd 1456 ft.

Cooke County—Clair H. Gannon-Harvey Bros. Dr. Co.'s Ware 1, sec 68-ac tr, W. W. Crisp sur, A-221, new pool, broken sand 2219-27½ ft, 72 bbls.

Jack County—W. H. Carter et al's Carney 1, J. D. Rogers sur A-501, abnd 3370 ft.

Throckmorton County—Rathke Oil Co.'s Swaggerty 1, ne sw BBB&C sec 258, Bend 4462 ft, Mississippian 5019 ft, abnd 5307 ft.

Wichita County — Akin - Dimock - Costley's Roller 1, nwc east 161-ac tr, sec 3, C. T. Ry. sur, A-47, abnd 1651 ft.

Wilbarger County—Consolidated Oil et al's Ancell 4-B, nwc nw ne H&TC sec 2, blk 7, new pay (Ellenberger) Consolidated pool, Ellenberger 4304 ft, pay 4368-81 ft, 3000 gals acid, 102 bbls oil, 40 bbls water.

Young County—P. C. Burns et al's Bernheart 1, nwc s½ e½ s½ TE&L sec 238, abnd 1068 ft. W. A. Buttram-J. B. Newby's Ferguson 1, sw part 209-ac tr, S. Tynes sur A-274, abnd 563 ft. J. G. Wooten et al's Cantwell 1-A, nec of J. J. Cantwell sur, A-1586, abnd 596 ft.

WEST TEXAS

FIRST REPORTS

Fisher County—Shell's Vaughn 1, 325-ac tr, H&TC sec 205, blk 3, lcn Ordovician test.

Lubbock County—L. C. Harrison et al's Nairn 1, c se se sec 25, blk A, J. H. Gibson sur, cem sur pipe.

Mitchell County—Humble's Elwood Farms 1, c w¼ of e¼ S.P. Ry. sec 49, blk 16, lcn Ordovician test.

COMPLETIONS

Martin County—Pete Wiggins-Ed Hyde's Stimson-Burley 1, c sw T&P sec 4, blk 38, T-1-S, elev 2838 ft, anhydrite 1870 ft, base salt 2730 ft, Yates sand 2820 ft, Grayburg lime 4190 ft, San Andres lime 4445 ft, abnd 5003 ft.

Terry County—Texas Co.'s Murphy 1, c nw nw PSL sec 22, blk K, elev 3548 ft, anhydrite 2410 ft, Yates frosted grains 3220 ft, brown lime 4180 ft, San Andres 4530 ft, abnd 5440 ft.

TEXAS GULF COAST

FIRST REPORTS

Harris County—McDannald Oil Co.'s Penn 1, Edw. Stimpson Sur., n of Dyersdale field, proposed depth 8500 ft, rigging.

Wharton County—J. P. Longmire's Hackstedt 1, Austin League, 3 mi n Boling, lcn.

COMPLETION

Chambers County—H. E. Williams' Trinity Rice Disposal Co. 1, Winnie Prospect, T&NO Sur. Sec. 45, abnd 8021 ft.

WYOMING

FIRST REPORTS

Laramie County—Harding Ranch 1, cnw nw 17-18n-65w dr 1040 ft shale, Indian Hill structure, Horse Creek area.

Sweetwater County—West States Oil Co.'s Humphrey 1, nw se se 10-12n-101w, csg 390 ft, Canyon Creek structure.

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MEN IN THE INDUSTRY'S NEWS

J. W. SELBY, chief scout for Shell Oil Company, Houston and other new officers of the National Oil Scouts & Landmen's Association were installed at a meeting held in Dallas last week. They were elected late in May at the organization's annual convention held in Dallas. Other officers are John V. Melton.

The Atlantic Refining Company, Shawnee, Oklahoma, first vice president; M. A. Ricketts, Sinclair Prairie Oil Company, Corpus Christi, second vice president; A. G. Schuler, Arkansas Pipe Line Company, Longview, secretary-treasurer, and Edward C. Harman, Seaboard Oil Corporation, Dallas, editor-in-chief.

C. L. BARRETT, Gulf Oil Corporation, Tulsa, was elected chairman of the Petroleum Safety Council in the Mid-Continent area. He was secretary-treasurer, and succeeds Hadley H. Myer, Sinclair Prairie Oil Company. Don A. Klemme, Stanolind Oil & Gas Company, was named vice chairman, and Robert Lauder, Shell Oil Company, was elected secretary-treasurer.

GEORGE W. CHAPMAN, Shreveport district scout for Sun Oil Company the past four years, has been transferred to Dallas division office for duty in petroleum engineering department. Newton Burnett, former North Texas scout, was given the Shreveport assignment, being succeeded by Robert Wilson, formerly attached to the Dallas office.

T. J. COFFEY, SR., and W. W. Shaddid have organized Sha-Fey Producing Company, to acquire and develop oil properties in Wheeler County sector of Texas Panhandle. Headquarters are at McLean, Texas.

MYATT S. LIPSCOMB, assistant in the executive department of Danciger Oil & Refineries, Inc., Fort Worth, has resigned to enter the land department of Midstates Oil Corporation, Tulsa.

HARRY A. GLENN, 57, North Texas production department chief clerk for Continental Oil Company, was fatally shot July 6 by a gunman at Wichita Falls, where he had resided the past 20 years.

G. R. PROUT, since 1939, manager of sales in General Electric Company's industrial control division, has been named manager of the division. He is succeeded as manager of sales by R. S. Glenn.

Prout, a graduate of Massachusetts Institute of Technology with degrees of B. S. and M. S. in electrical engineering, joined the company's small motors department in 1923. The following year he was transferred to the company's southwestern district, where he served for 15 years as motor and industrial control specialist and as specialist in electric equipment for the petroleum industry. In 1939, he was named acting manager of the industrial department in the southwestern district, transferring to Schenectady late the same year as manager of sales.

Glenn, who has been general assistant to the manager of the industrial control section since 1930, joined the company in 1916 in its industrial control engineering department at Schenectady. Three years later he was transferred to the industrial control section of the industrial department.

M. J. TENNES, JR., president of Shafer Bearing Corporation, Chicago, has entered active service as captain in the Army Air Corps, stationed at the Advanced Flying School at Phoenix, Arizona. Management of the company in his absence is being directed by John F. Ditzell, vice president.

W. G. GREEN, president of the Tulsa chapter of Nomads, has announced all sessions planned for July and August have been cancelled. The next regular meeting of the chapter will be Monday, September 15.

A. B. BARNETT, formerly with Harbar Drilling Company and Cetal Drilling Company, has organized Barnett Drilling Company with offices at 521 First National Bank Building, Wichita.

FRANK C. NEAL, JR., has been named district arc welding specialist for General Electric Company in the Dallas district, succeeding N. M. Voorhies, who has been transferred to the Chicago office. A 1936 graduate of Kansas University, he became associated with the company's testing department at Schenectady, in 1938 was assigned to International General Electric Company, and the following year joined the company's welding section to handle application engineering and problems relating to welding.

EDWARD J. McCANN, superintendent for South Chester Tube Company, Chester, Pennsylvania, has been named general works manager. He joined the company 21 years ago as night superintendent, and previously worked his way up from office boy to planning department manager for Reading Iron Company. W. C. Hale, formerly with Gulf Oil Corporation at Tulsa and more recently in the sales department of South Chester Tube Company, has been named assistant to the general works manager.

JAMES P. HART, Texas assistant attorney general in charge of oil litigation, has resigned to enter private practice at Austin. He was in charge of the litigations in the Rowan & Nichols and Humble Oil & Refining Company suits, which were carried to the United States Supreme Court. He had planned to resign for several months but remained at the request of the attorney general to complete pending suits.

H. C. VANDERPOOL, geologist for Harry S. Moss, Dallas discoverer of the Pittsburg deep pool, Northeast Texas, has resigned to join Seaboard Oil Company's geological staff, with headquarters at Dallas. The latter company is preparing to expand its activities in West Texas.

CLIF HODGES, 41, superintendent of the Rocky Mountain division for Halliburton Oil Well Cementing Company, was killed in an automobile accident at Craig, Colorado, on July 3. Hodges, who made his headquarters at Casper, was buried in Houston July 7. He was described by Claude Parsons, vice president of Halliburton, as "one of the steadiest and most reliable men in our organization." Hodges had been with Halliburton since 1925, and had served in Houston, Cali-

Representatives of Dehydro Company recently held their semi-annual sales meeting in Tulsa. In attendance were H. L. Berkey, manager; H. S. Horton, sales manager, and Orval Humphrey, LeRoy Horton, Ira W. Lind, Howard W. Andrews, Arlin A. Beavers, William T. Roach, Lester L. Hunter, J. C. Nicholson, Dale Shappell, B. C. Flynn, Duncan Marquiess, Aaron Ratliff, Mark Bolles, E. E. Lewis, Ralph Bussett, W. M. Best, Russell C. Anduss, W. A. Preston, Claud C. Best and Murl R. Ogden.

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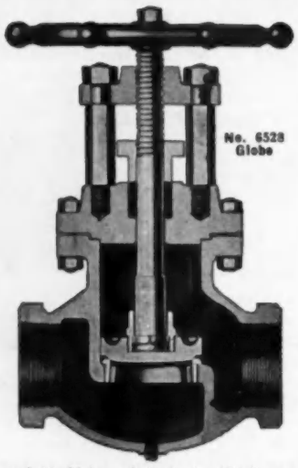

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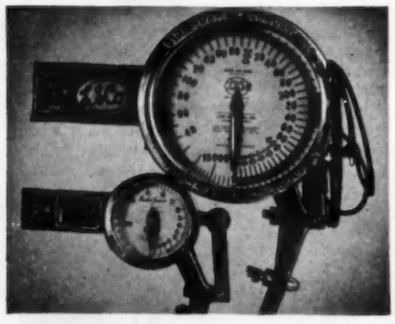

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fornia, West Virginia and Oklahoma in addition to the Rocky Mountain territory. He is survived by his widow and two daughters.

J. R. SPENCE, who has served Stoody Company, Whittier, California, for the past six years as chief metallurgist and as industrial sales and research manager, has been named general sales manager. Active in the hard-facing industry for many years, he has been active in the development of several hard-facing alloys, and in determining correct procedures for hard-facing many types of industrial equipment.

JAMES K. PUTNAM, 85, retired Tulsa oil operator, died July 7 at his home. Born in Meadeville, Illinois, he followed the oil business all his life in Pennsylvania, Oklahoma and Illinois. He went to Tulsa 28 years ago.

J. H. McDONALD, who in 1909 founded Atlas Supply Company, Muskogee, Oklahoma, and served as its president since that time, retired last week as active head of the company. He was succeeded by J. E. Neudoerfer, vice president in charge of sales for Wheeling Steel Corporation. J. R. Brooks, with the Atlas organization for 30 years, resigned as vice president and secretary to become vice president and general manager. H. U. Everett has been elected secretary.

McDonald worked as a railroad yard master, freight clerk and locomotive fireman, and operated restaurants in Chicago's loop district before entering the oil equipment field in Ohio with Union Supply & Hardware Company. In 1902, he became general manager of Cudahy Oil Company, Bartlesville, drilling the first producing wells in that district. From 1905-09, he was vice president and general manager of Bovaird-Sefang, Bradford, Pennsylvania. With Clayton M. Mark, he established Atlas Supply Company at Muskogee in 1909, while, at the same time, Mark and others founded the Steel & Tube Company of America with Atlas Supply Company as a subsidiary. Both organizations were absorbed by Youngstown Sheet & Tube Company in 1923, and later that year McDonald and his associates bought the supply business from Youngstown, along with stores in Muskogee and Ft. Worth. In January, 1939, Atlas was sold to Wheeling Steel Corporation.

B. F. KRAUSE, a graduate of A. & M. College of Texas and for the past two years with Oil Lift Supply Company at Kilgore, has been named representative in the Wharton, Texas, area for McEvoy Company, Houston. He is making his headquarters at 605 Carey Street, Wharton.

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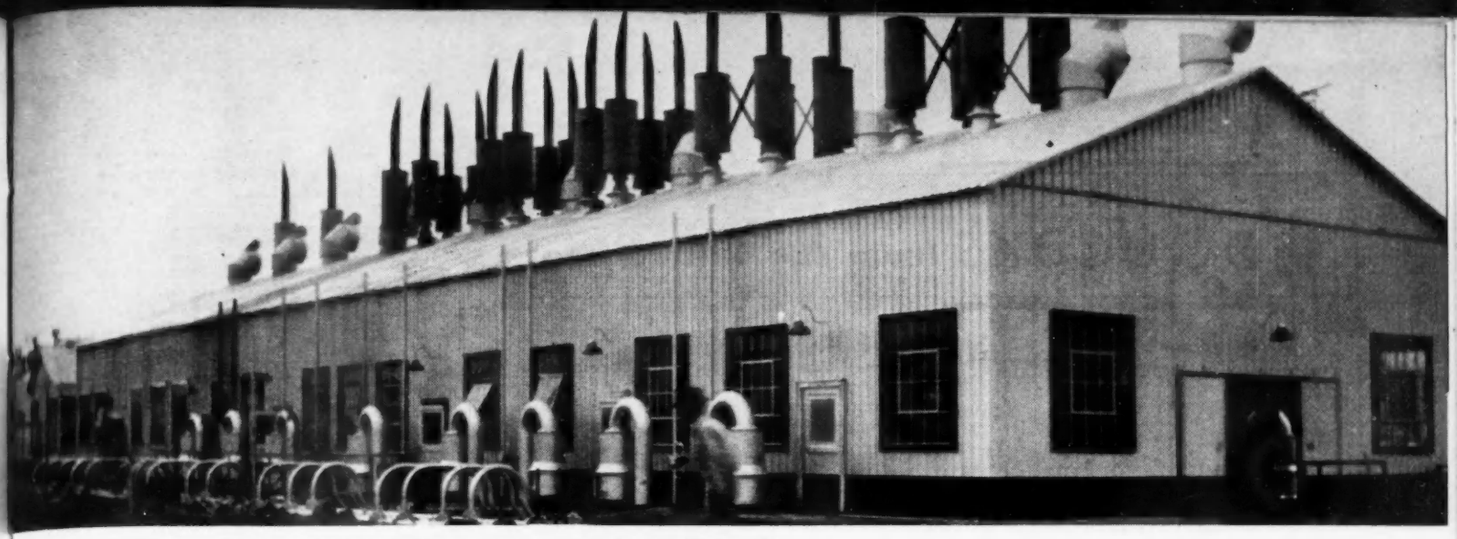

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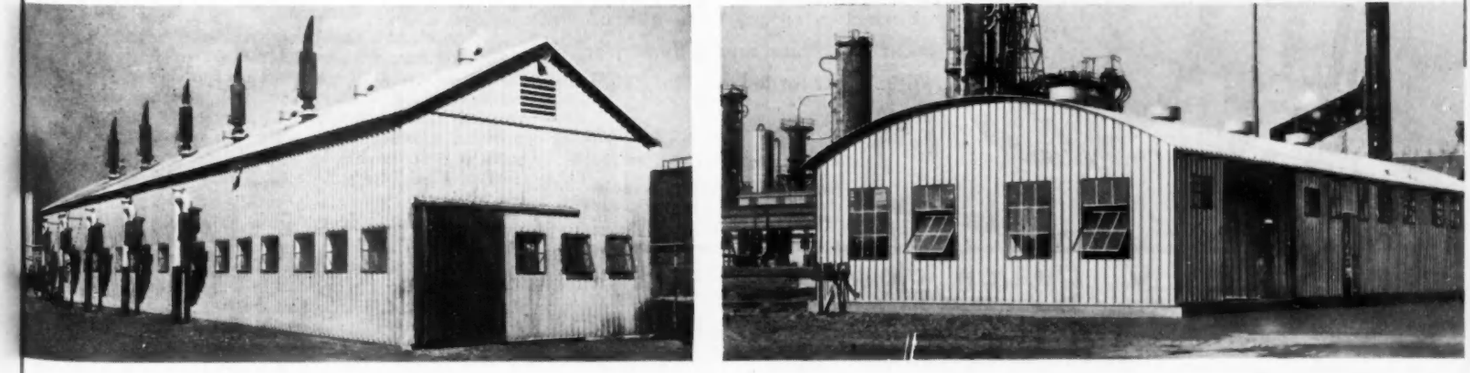

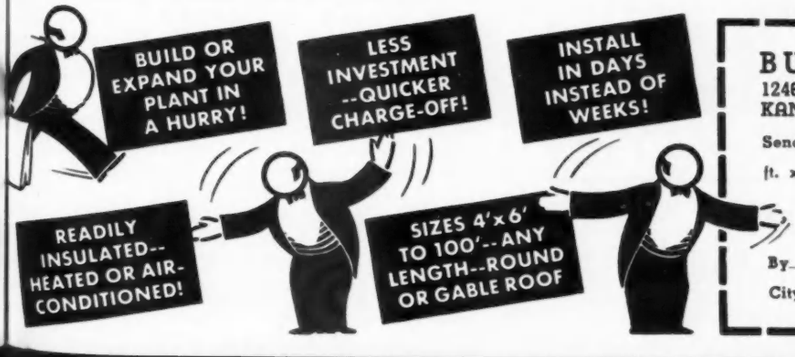
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Squeaks from the Bull Wheel

Spendthrift

"Is Jinks careless with his money?"

"Is he? I've known him to buy bread when he didn't have a drop of gasoline in the tank!"

Educated

Did you knock on that traveling man's door and wake him as I told you to do?" inquired the boarding house lady.

"Yes'm," replied the new maid fresh from the country. "But he didn't wake up, so I finally had to go in and shake him."

"Good heavens, don't you know better than to ever go into a traveling man's room?"

"Yes'm. I do now!"

Success

"Dad, what was your great ambition when you were a boy?"

"To wear long pants. And I've had my wish. If there is anybody else that wears pants longer than I do, I'd like to see him."

Excuse

A negro butler was a good servant except that he could not keep from laughing at guests' jokes he overheard at dinner. The lady of the house had remonstrated with him repeatedly, until in desperation and in advance of a dinner party she told him that the next offense would mean dismissal.

In the course of serving dinner that evening the butler overhead something that uncorked a laughing spell, and true to promise, he was up for dismissal the next morning.

"I warned you, Jim," the lady told him, "you are a good butler and we would like to keep you, but you just can't control your laughter and we can not have that in the dining room when we have guests. I am going to have to let you go."

"Ma'am," answered the negro, "you ought not to fire me for that, 'cause that was one of the funniest jokes I ever heard. It was so funny that I told it to my fiance when I got home last night, and she laughed so she fell right out of bed."

Poor Pa

"I inserted an advertisement in our local newspaper recently under a box number for a male partner to accompany me on a fortnight's hiking trip," said a girl hiker.

"How interesting. Did you have many replies?"

"Yes, hundreds—but there was a terrible row in the house over it."

"Good gracious, why?"

"Father was one of the applicants!"

How it Works

"So you believe in socialism?"

"Sure I do, it's the only way; divide up everything equal."

"You mean that if you had two horses you would give me one?"

"Sure I would."

"And if you had two cows, would you give me one?"

"Of course, I would."

"And if you had two pigs, would you give me one?"

"You go to. You know I got two pigs."

Serious

A Scotchman had been presented with a pint of rare whiskey. He was walking home, when a car knocked him down, hurt his leg badly. He got up and limped down the road. Suddenly he noticed something warm and wet trickling down his leg.

"Oh, God," he groaned, "I hope that's blood!"

Is It Ever Thus?

"Oh, Darling," he murmured, "I love you so. Please say you'll be mine. I'm not rich like Percival Brown—neither do I have a fine car like he has; nor a well-stocked cellar, but Darling, I love you, and I cannot live without you."

Two soft arms stole around his neck, and two ruby lips whispered in his ear: "And I love you too, Darling, but where can I get in touch with this man Brown?"

Stymied

And can you tell me his last words?

He had no last words—his wife was with him to the end.

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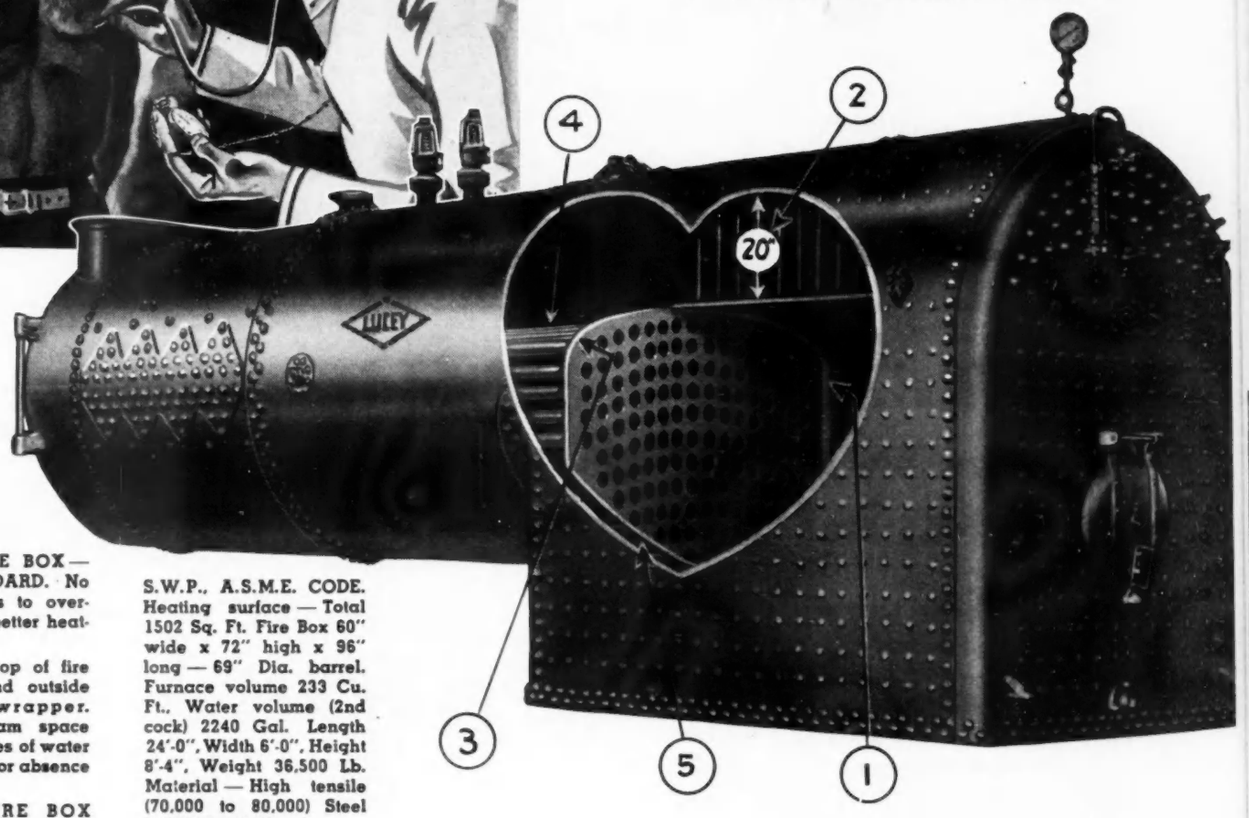

FEATURES:

1. WELDED FIRE BOX—LUCEY STANDARD. No laps, no rivets to overheat or burn, better heat-transfer.
2. 20" between top of fire box crown and outside wagon top wrapper. Plenty of steam space with two gauges of water compensating for absence of dome.
3. ARCHED FIRE BOX CROWN, large corner radii, good staybolt threads, stronger construction, easy cleaning, better combustion.
4. SHORT TUBES (seamless) in vertical rows. Effective Heating Surface.
5. 4" WATER SPACE all around fire box. Good water circulation.
6. ONE BOILER—150 H. P. (A.P.I.) 350 Lbs./Sq. In. S.W.P., A.S.M.E. CODE. Heating surface — Total 1502 Sq. Ft. Fire Box 60" wide x 72" high x 96" long — 69" Dia. barrel. Furnace volume 233 Cu. Ft., Water volume (2nd cock) 2240 Gal. Length 24'-0", Width 6'-0", Height 8'-4", Weight 36,500 Lb. Material — High tensile (70,000 to 80,000) Steel ASTM-A-149-36.
7. OPERATING LOADS—Per hour, Temperatures, Steam 435.7° F. Feed Water 62° F.

WATER		BOILER	RATING
Gal.	Lbs.	H.P. Developed	
430	3587	150	100%
633	5276	225	150%
855	7130	300	200%
1050	8792	375	250%
1265	10550	450	300%
1475	12310	525	350%

Note—One boiler horse power 33,479 B.T.U.

DISTRIBUTORS:

Lucey Products Corporation, Tulsa, Okla.
Bridgeport Machine Co., Wichita, Kans.
Houston Oil Field Material Co., Inc., Houston, Tex.
Murray-Brooks Hardware Co., Ltd., Lake Charles, La.
Louisiana Supply Co., Sulphur, La.

EXPORT: Lucey Export Corporation, 3505 Woolworth Bldg., New York, N. Y., Broad Street House, E. C. 2, London, Eng.

LUCEY

LUCEY BOILER and MANUFACTURING CORPORATION

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LOS ANGELES, CALIFORNIA

Chattanooga, Tenn.

811 STERLING BLDG.
HOUSTON, TEXAS

TESTED and RETESTED MORE THAN 70 TIMES TO INSURE THE—

UNIFORMITY

...QUALITY and PERFORMANCE of

SUN LUBRICANTS

SUN manufactures a Complete Line of LUBRICANTS

Sun Research Laboratories have not only achieved fame for their outstanding developments in the petroleum industry—but also for maintaining uniform high quality in every product that is developed.

Gallon after gallon . . . drum after drum Sun's petroleum products are tested and retested more than 70 times to assure uniformity . . . consistent high quality . . . and peak performance.

SUN OIL COMPANY

PHILADELPHIA, PA.

Texas Sales Offices: DALLAS and BEAUMONT

The TEXAS COAST looms larger than ever in the Defense and Industrial Picture

NEW shipbuilding plants, a new steel mill, expanded refinery facilities, new plants for the manufacture of toluol, synthetic rubber, and defense equipment, Army and Navy training centers—these, with the generally accelerated industrial pace and conversion to defense production, make the ever-important Texas Coast Country loom larger than ever in the industrial picture. It is important as a rapidly widening market for industry's products, as well as an important defense production and training center. And with the return of normal times, your plant investment here should be a profitable one throughout the years ahead.

As wholesalers of NATURAL GAS, *with unlimited reserves and adequate pipe lines serving the strategic Texas Gulf Coast with this fuel and raw material for chemical processes*, we profit with the industrial expansion of this region. That is why we are glad to assist you in an investigation of the natural resources and ample facilities of this area, *individualized* to your company's processes and products. We offer you the services of our special Research Department for this purpose without cost or obligation.

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Subsidiary of Houston Oil Company of Texas

GEO. A. HILL, JR., President

Wholesalers of Natural GAS

NOTES FOR THE Equipment Buyer and User

Pump

POMONA PUMP COMPANY

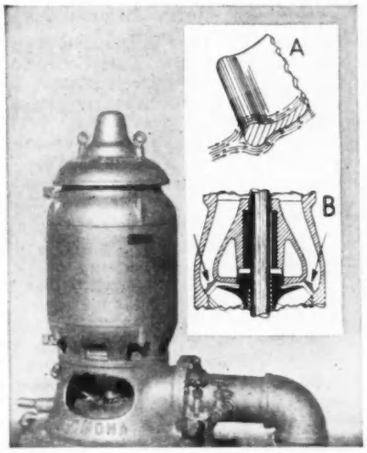
Design improvements to eliminate hydraulic losses in pumps, involving changes in guide vanes which alter from horizontal to vertical the flow direction of fluids being pumped, have been announced by Pomona Pump Company, St. Louis.

Advanced vane ends are formed in a bulbous shape to provide that, regardless of the flow direction of the fluid, its direction will always be substantially tangential to the vane surface. The change from guide vanes formerly constructed as thin as possible on the theory that the less metal the fluid strikes, the less is the resistance, is designed to secure greater uniformity of flow pattern, reduce friction, increase fluid lift efficiency, and to eliminate formation of eddy currents.

The new guide vanes are an inherent part of the pump bowl assembly, and the new design may be employed merely by substituting a new bowl assembly in present pumps of the manufacturer.

Metallizing

Metallizing Company of America, Inc., 562 West Washington Boulevard, Chicago, has published a 52-page booklet on "The History, Purpose and Practice of Metallizing." It describes the principles employed, illustrates equipment, and outlines procedures. Pictures show how the work is done, and illustrate finished parts.



Pomona vertical pump equipped with new guide vanes. Insert A shows bulbous shaped end of guide vane; Insert B shows cross-section of bowl assembly.

Recorder

THE BROWN INSTRUMENT COMPANY

A system for measuring differences in temperatures, flows, levels, or pressures, designed Differential New-Matic Transmitting System, has been announced by The Brown Instrument Company, Wayne & Roberts Avenues, Philadelphia.

The system employs two measuring elements equipped with pneumatic transmitters, each delivering an air pressure proportional to the measured variable, and a differential pressure detector employing a mercury-filled U tube and a float actuating a recording or indicating pointer.

It is designed for controlling, indicating or recording difference in inlet and outlet temperatures on feed-water heaters, condensers, air preheaters or heat exchangers; difference in levels in two remote tanks; difference of pressures in two remote pipe lines; difference of pressures in two closely associated pipe lines where fluid from one line may not be permitted to enter the other; difference in outgoing and return flows in circulating systems; difference in flows from two tanks, reservoirs or boilers; difference in temperature between top and bottom of tower or

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WHEREVER THERE'S OIL, YOU'LL FIND THEM!

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THORNHILL-CRAVER COMPANY
HOUSTON

No Production Interruption with WICO IGNITION

The Wico AP Magneto is specifically designed to meet the 24-hour uninterruped needs of the oil fields. Features include adequate ventilation, high voltage spark output, moisture resistance, long coil life and accessibility. Condenser, coil, breaker points can be replaced with an ordinary screw driver, without removing magneto from the engine. See your local Wico authorized dealer.

WICO ELECTRIC CO.
SPRINGFIELD, MASS.

Steel Prices are advancing

It's cheaper to repair your valves than replace with new. No valve too damaged for us to renew so it will give you much more service.

Any size, kind, condition or pressure, for Drilling, Producing, Refining and Pipe Line.

RECONDITIONED VALVES FOR SALE

AIRLINE
VALVE AND MACHINE WORKS
PHONES: Day - Val. 2-2912 • Night - Val. 2-6027
1836 AIRLINE DRIVE - HOUSTON

NOTES FOR THE Equipment Buyer and User

tank; difference in inlet or outlet temperatures on bearings, lubrication systems on diesel engines or turbines, and difference in inlet and outlet temperatures of superheater.

Publish Proceedings of Third Appalachian Meter School

Proceedings of the third annual Appalachian Gas Measurement Short Course have been printed in book form, and have been distributed to all who were registered at the 1940 meeting.

Jointly sponsored by the University of West Virginia and the West Virginia Public Service Commission, the school was held in Morgantown last August, with R. W. Hitchman, United Fuel Gas Company, serving as chairman of the committee. Over 400 gas men attended.

Dates for the fourth meeting of the school, which will be conducted under the chairmanship of A. F. Kraus, Peoples Natural Gas Company, Pittsburgh, have been announced as August 18, 19, and 20, 1941.

Kraus and his committee members are now developing the program in which nationally known authorities in the gas industry will participate. Announcement cards listing the activities will be released this month.

Proceedings of the 1940 school cover papers read and discussed on the general theme, "The Theory and Practice of the Measurement and Control of Gases." It is a paper cover, bound volume of 485 pages containing photographs, charts, curves and diagrams. A limited number of extra copies are available. They can be obtained at $1 a copy by addressing G. R. Spindler, director of the school, West Virginia University, Morgantown, West Virginia.

Jones & Laughlin Enlarges Wire Rope Plant at Muncy

An extension to its wire rope plant at Muncy, Pennsylvania, and installation of additional equipment, has been authorized by Jones & Laughlin Steel Corporation, Pittsburgh.

Work was started last week on a 120x275-foot addition to house a new closing machine which fabricates the strand into finished rope, and to provide warehouse space. A new office building is also being constructed.

Fencing

Anchor Post Fence Company, Baltimore, has issued Catalog 110 showing protective fences of the chain-link type. Including 40 pages and 60 illustrations, it shows 14 models in various settings. A composite table gives pertinent information on all types, and structural details are shown by line drawings.

Trencher

The Buckeye Traction Ditcher Company, Findlay, Ohio, has issued Bulletin 4B-11, giving details of design and construction improvements on its Model 11 utility trencher. The unit is the smallest of the company's wheel-type trenching machines, and cuts trench from 11½ to 22 inches wide, and up to 5½ feet deep.

Cardwell Manufacturing Company Celebrates Fifteenth Anniversary

Cardwell Manufacturing Company, Wichita, is currently celebrating its fifteenth anniversary.

The company was organized by H. W. Cardwell, now its president, who previously spent 14 years in engineering and construction contracting, and 10 years as a dealer in industrial and farm machinery. Cardwell, while engaged as a machinery dealer, saw an opportunity for improving oil-field equipment, and entered the field by building hoisting units on tractors. He organized his own company in 1926.

The first Cardwell machine was a hoisting winch mounted on an industrial tractor. It was placed in service in central Kansas, pulling rods and tubing. The machine met with favor, and its production along with a skid-mounted unit was undertaken on a larger scale. Size of the units was increased, and within four years the machines were also being used extensively for cleanout operations. A spudding attachment was added to the cleanout machine in 1931, making it a drilling unit, and in 1932 the company built a rotary drilling unit.

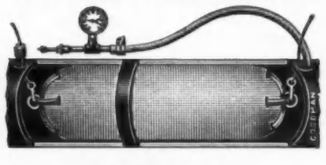
The company strove for lighter weight equipment without sacrifice of hoisting capacity, and in a modernization program toward that end employed alloy steels to reduce shaft diameter and lighten frames, cut-steel sprockets to permit use of roller-type chain, remodeled clutches on the drum, and heat-treatment of wearing parts. The drum barrels were made from laminated plate steel, rolled into a cylinder.

Reduction in weight permitted mounting double-drum draw-works, transmission and an industrial internal-combustion engine on a single skid for hauling by a large truck. The company's largest unit of this type is rated for cleanout work by cable-tool or rotary method to 10,000 feet.

With the exception of units designed specifically for rotary drilling, the company's larger draw works can be converted to cable-tool machines by addition of a beam or oscillating-type spudding attachment consisting of an arm and guide mounted in front of the drum and an eccentric drive from the catshaft and the oscillator.

In addition to skid-mounted units, the company has trailer- and tractor-mounted units, and a specially designed

STOPPERS FOR OIL LINES



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SAFETY GAS MAIN STOPPER CO.
523 Atlantic Ave. Brooklyn, N. Y.

There Is Only One . . .

"Safety-Pull" HOIST

Its very name is its description.

The COFFING "Safety-Pull" is the safest and fastest operating ratchet lever hoist built because it is the only hoist with a dual ratchet and pawl assembly, independent of each other. The load is always under control. There is no clutch to slip or drop load. Portable - Lightweight - for Pulling or Lifting. Capacities 3/4 to 15 tons, weighing from 14 to 150 pounds.

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Coffing Hoist Co.
Danville, Illinois

WILLIAMS
DROP-FORGED TOOLS

BOX WRENCHES

MADE BY THE MAKERS OF "VULCAN" TONGS

Williams' Wrenches offer the same dependable performance which has made "Vulcan" the most popular oil-field tong.

The Williams' line includes a comprehensive assortment of box wrenches for every oil field and refinery requirement. Included are both carbon and alloy steel types, with square, hex and 12-point openings in straight, offset and double offset patterns. Certain types are made in "Heavy pattern" for severe service and are available also with a "striking-face."

Williams' Carbon steel types are known as "Superior" wrenches and, although approximately *twice as strong* as old-fashioned carbon steel wrenches, they sell for the same price.

Williams' Alloy wrenches are trade marked "Superrenches." These light, trim wrenches are forged from chrome-molybdenum steel and possess exceptional strength and toughness.

All Williams' wrenches are fully guaranteed. Write for complete Williams' catalog, or see our advertisement in the Composite Catalog. Buy from your supply store.

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EXPLORATION GEOPHYSICS describes the fundamental theories, equipment and field techniques of the recognized exploratory geophysical methods and illustrates their application to problems of economic geology. Concisely and clearly written, it is a valuable book for geophysicists; geologists; teachers, physicists; petroleum, mining and civil engineers; supervisors and production men of oil and mining companies; supervisors and directors of public works; patent attorneys; prospectors; et al., who need the latest and most up-to-date, authoritative information. Unequalled in completeness of authoritative information and clarity of expression. It is a complete compilation of modern Geophysical techniques.

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CORRECT-POSTURE CHAIR

A Better Chair for Better Health

PROMOTES ALERTNESS AND EFFICIENCY

Sturdy, all-metal office chair, scientifically designed to provide comfortable, healthful seating. Back support relieves bodily strain and cramped abdominal muscles. Easily adjusted without tools. Noiseless, ball-bearing swivel. Choice of styles, colors and upholstery. Low prices.

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Send me complete information about Burroughs Correct-Posture Chair.
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unit designated "Mobilhoist." Both tractor-mounted unit and the "Mobilhoist" are powered by the same engine used to move them over the ground, and both are equipped with masts designed to be raised in a few minutes. They are employed for servicing and drilling.

During its history, Cardwell Manufacturing Company has designed and placed in volume production five skid-type and one pneumatic-tired servicing hoist, and three sizes mounted on tractors for use on wells from 1000 to 15,000 feet; four double-drum models of combination rotary and cable-tool servicing and drilling rigs; four sizes of single- and double-drum rotary draw works, single- and twin-engine drive; four sizes of pipe-line sidebooms, and one trench backfiller.

B & W Makes Distribution Arrangement With Supply Stores

B & W, Inc., Houston and Los Angeles, has completed arrangements with major supply stores for stocking and distribution of its combination casing guides and wall scratchers.

This will make it possible for those desiring to use this equipment to procure fast delivery.

Los Angeles Nomads Elect Fourteen to Membership

Eight regular and six associate members were elected to membership by the Los Angeles chapter of Nomads at the June meeting, and preliminary plans were made for a barbecue and golf tournament in August, and for a meeting to be held in connection with the API annual meeting in November.

Elected to regular membership were Tom Murphy, Martin-Decker Corporation; Roland E. Smith, Grant Oil Tool Company; Tom Martin, with Bob Eiche; T. M. Johnson, M. O. Johnson Oil Field Service Corporation; Ralph W. Marshall, Drilling & Exploration Company; Web Wilson, Web Wilson Oil Tools Company; J. J. Siegel, Kobe, Incorporated, and William McGraw, Western Pipe & Steel Company.

Named to associate membership were John P. Isaacs, Reed Roller Bit Company; Ralph Clemens, Mission Manufacturing Company; Earl E. Cater, H. C. Smith Oil Tool Company; Reed O'Neil, Reed Roller Bit Company; Earle M. Boggess, Baker Oil Tools, Inc., and Stewart F. Remmel, Byron Jackson Company.

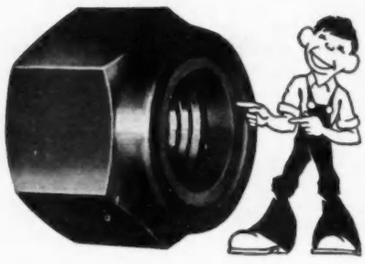
Texasteel Manufacturing Opens Houston District Office

Texasteel Manufacturing Company, Fort Worth, has announced opening of a new district sales office in the West Building, Houston. W. A. Scott is in charge.

The company recently moved into its new main office building at 3909 Hemphill Street, Fort Worth.

Griscom-Russell Moves Houston and Tulsa Offices

The Griscom-Russell Company has moved its Houston office to 1548 Esperson Building, and its Tulsa office to 810 Petroleum Building.



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solved the oil field fastening problem

IN every Elastic Stop fastening, it is the resilient fiber collar that keeps the nut tight . . . by automatically eliminating thread play when the nut is applied, and by continuing to hold the load-carrying thread faces in a constant pressure-contact. The collar absorbs vibration and shock.

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ELASTIC STOP NUT CORPORATION
2360 VAUXHALL ROAD • UNION, NEW JERSEY

Elastic Stop SELF-LOCKING NUTS

STOP that waste of
Time, Toil, Temper and PROFITS
with Acme's New "Wonder-Tool"—the
MUD COLLAR

Not what it IS but what it DOES for the Rotary Driller is the "pay-off." It's really *sensational* — the savings it shows. Yes! It does more than promised.

In *Sticky Formations:* Acme's Mud Collar prevents bits "balling up" and "mud rings" forming.

In Any Formation: It assures faster cutting, longer runs, fewer "green" bits, better hole and less drill pipe torque. 6 Hi-velocity fluid streams keep cutters clean . . . wash cuttings off bottom . . . make cutting faster and freer. Also lubricate and keep fresh cuttings out of bit bearings.

Order through your Supply Store. If not in stock, write and let us tell you ALL about this Modern Marvel Tool.

Get Full Particulars—TODAY!

Acme Fishing Tool Co.
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U. S. A.
"The World's Standard of Quality Since 1900"

This Oil String Will Never Leak!

*Trade-mark Reg. U.S. Pat. Off.
Sold in container sizes to meet your needs.

Every joint, as made up to run, is treated with RECTORSEAL*. This means permanent leakproof joints, impervious to oil, gas, salt water . . . even dilute acids. The plastic, elastic seal formed by RECTORSEAL is positive protection against "freezing" or galling, and the joint is easily broken out at any future date. Pictured above is just one of the many major operators now standardized on RECTORSEAL to avoid future casing (or tubing) leaks. One gallon treats the field end of 5,000 feet of 5" oil string . . . 7,000 feet of 2½" tubing. Specify RECTORSEAL, by name, at your Supply Store. Write Rector Well Equipment Co., Ft. Worth, Texas, U.S.A. for full details.

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COMPANY ----------

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"ROPE DOPE" is a valuable periodical bulletin filled with information, not advertising. You'll want every copy in your reference file for uses and application of wire rope. There is no charge for it. To be on our mailing list, simply send us the information asked for above.

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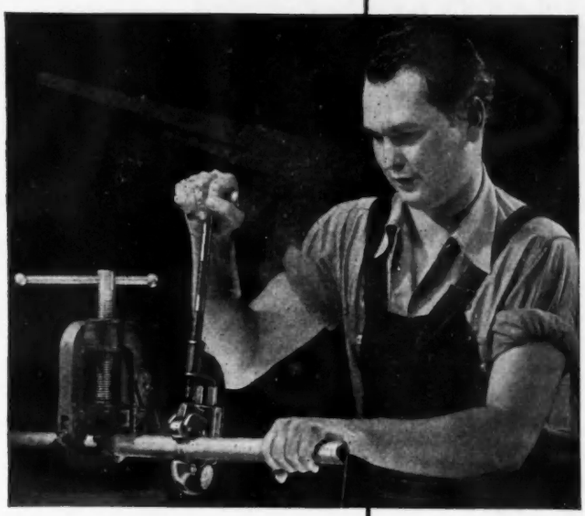

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Special Forged Cutter Wheels Assure You Faster Cleaner Pipe Cutting

RIDGID heavy-duty cutter — 4 sizes, capacities to 4". . . Also No. 42 with 4 wheels for work in close quarters

MEN ARE WILLING—give them the help of the speediest most modern tools and watch them "deliver ahead of schedule."

Everywhere you find these efficient RIDGID Pipe Cutters by hundreds of thousands cutting all kinds of pipe more easily and quickly. They save cutting and reaming time. That unusual blade type wheel—forged and assembled in solid hub—sets new speed and endurance standards.

Heavy-duty type, these cutters are *guaranteed* to cut true. For the economy of more work and less expense, ask your Supply House for RIDGID Cutters. . . The Ridge Tool Company, Elyria, Ohio.

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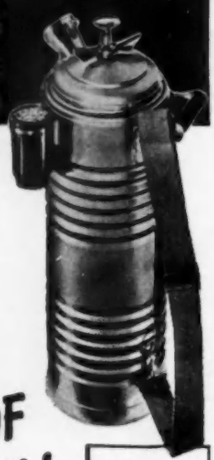

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Costs less per man to maintain than any other water or drinking equipment.

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FITLER MANILA BULL ROPES

Fitler Brand Manila Bull Ropes are made 3-strand, of Long Fibre Pure Manila Hemp, selected for strength, flexibility and durability; properly lubricated, and treated with a water-repellent preservative, for protection against the elements.

All Fitler Brand Manila Bull Ropes have a Blue and Yellow Colored Yarn Trademark on the outside of one strand, appearing at intervals along the entire length of the Bull Rope.

FITLER PHILADELPHIA CRACKER — Look for the Blue and Yellow Thread

FITLER "PHILADELPHIA" CRACKERS

Designed for use with a wire line, are noted for their power of endurance and extraordinary number of feet drilled per Cracker. They are made special Cracker Lay, but otherwise constructed and trademarked in the same manner as Fitler "Philadelphia" Manila Drilling Cables.

See Page 753 of The Composite Catalog

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Established 1804

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* Indicates that detailed information on the manufacturer's products or services may be found in the 1941 edition of The Composite Catalog of Oil Field & Pipe Line Equipment.